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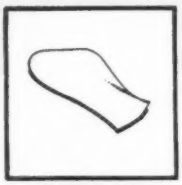

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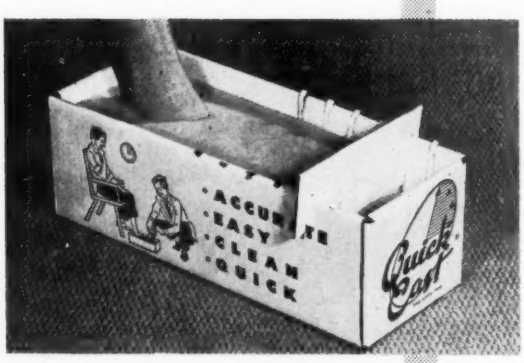

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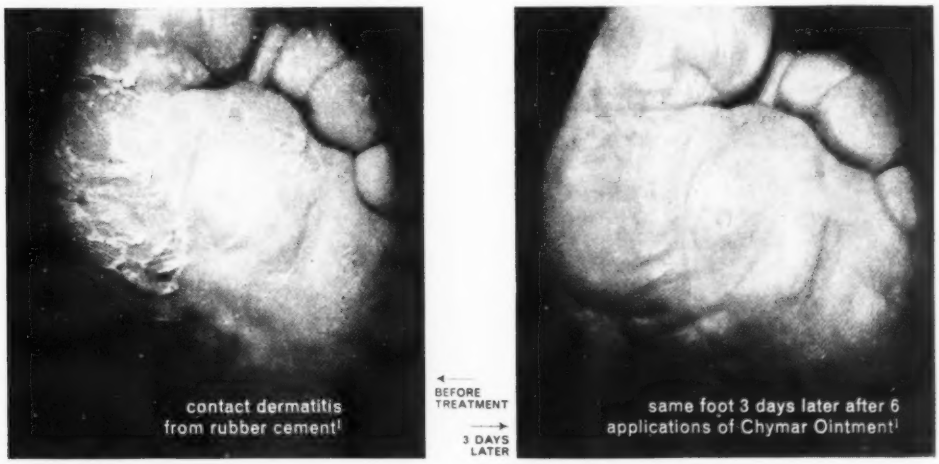
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1. Walker, M. H.: The Therapeutic Use of a Corticosteroid-Antibiotic-Enzyme Ointment in Common Foot Lesions, to be published. 2. Lucas, R. D.: Current Podiatry (March) 1960. 3. Streiker, F. B.: The Use of Chymotrypsin in Foot Orthopedics. Paper Presented at the Annual Meeting, American Podiatry Association, Chicago, Illinois, August, 1960.

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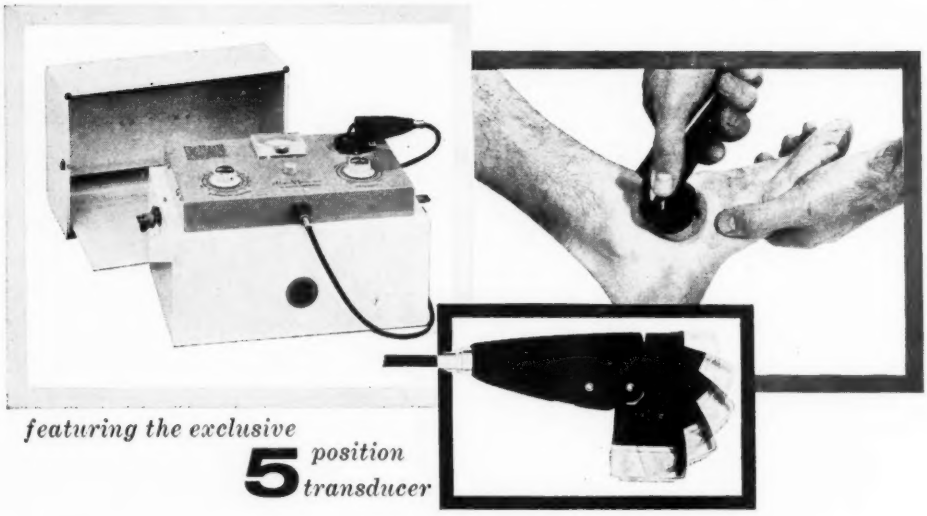

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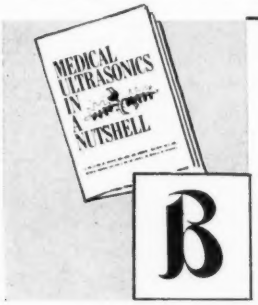

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STATE BOARD MEETINGS
FOR EXAMINATION AND LICENSURE

Alabama

The Alabama Medical Board of Examiners. **Board Secretary:**

Arizona

Arizona State Board of Chiropody Examiners. **Board Secretary:** Martin Snyder, D.S.C., 2629 E. Broadway, Tucson, Ariz.

Arkansas

Arkansas State Chiropody Examining Board. **Board Secretary:** Dr. Bernard S. Paul, 1508 Rogers Ave., Fort Smith, Ark.

California

The California Chiropody Examination Committee will meet for examination tentatively March 7-8, and Aug. 22-23, 1961 in Los Angeles; June 20-21, 1961 in San Francisco; Oct. 17-18, 1961 in Sacramento. **Board Chairman:** Abraham Hoffman, D.S.C., 2320 Sutter St., San Francisco, Calif. **Executive Secretary:** Mr. Wallace Thompson, 1021 O St., Sacramento 15, Calif.

Colorado

Colorado State Board of Chiropody Examiners. **Board President:** Dr. G. F. Helbig, 327 Logan St., Denver, Colo.

Connecticut

The Connecticut Board of Examiners in Chiropody. **Board Secretary:** Dr. F. J. Ruggiero, 3 South Main Street, W. Hartford 7, Conn.

Delaware

The State Board of Chiropody Examiners of Delaware. **Board Secretary:** Dr. Bertram H. Blum, 112 So. State St., Dover, Dela.

District of Columbia

The Board of Podiatry Examiners of the District of Columbia will meet for examination July 11, 12, 1961 at the Dept. of Occupation and Professions, Wash., D. C. **Board Secretary:** Harry L. Hoffman, Ph.G., D.S.C., Dept. of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington 6, D. C.

Florida

The Florida State Board of Chiropody Examiners. **Board Secretary:** Dr. Heywood A. Dowling, 203 Greenleaf Bldg., Jacksonville, Fla.

Georgia

The Georgia State Board of Podiatry Examiners. **Board President:** Dr. Charles W. Beasley, Jr., 1205 First National Bank Bldg., Atlanta, Ga.

Idaho

The Idaho State Board of Chiropody-Podiatry. **Board Secretary:** Dr. J. E. Franden, 412 Eastman Bldg., Boise, Idaho.

Illinois

The Illinois Chiropody Examining Committee will meet for reciprocity June 14, and examination June 14-16, 1961 at 160 No. LaSalle St., Rm. 201, Chicago, Ill. (Applications for examination must be on file at Dept. of Registration & Education, Rm. 112, State House, Springfield, Ill., at least 15 days prior to date of examination.) **Superintendent of Registration:** Fredric B. Selke, Room 109, State House, Springfield, Ill.

Indiana

The Indiana State Board of Podiatry Examiners. **Board Secretary:** P. T. Lamey, M.D., 422 Citizens Bank Bldg., Anderson, Ind.

Iowa

The Iowa State Board of Chiropody Examiners will meet for examination June 5-7, 1961 at the State Office Bldg., Des Moines, Iowa. **Board Secretary:** Dr. C. C. Reinheimer, 111 W. 2nd St. South, Newton, Iowa.

Kansas

The Kansas State Board of Podiatry Examiners. **Board President:** Dr. L. E. Krause, 1107 Williams St., Great Bend, Kansas, or Kansas Board of Podiatry Examiners, 872 New Brotherhood Bldg., Kansas City, Kansas. **Board Secretary:** F. N. Nash, M.D., 864 New Brotherhood Bldg., Kansas City, Kansas.

Kentucky

The Kentucky State Board of Chiropody meets on the third Saturday and Sunday of June and the first Saturday and Sunday of December each year. The December meeting is for re-examination only. **Board Secretary:** Dr. Chester A. Nava, 4140 Shelbyville Rd., Louisville 7, Ky.

Louisiana

Louisiana State Board of Medical Examiners. **Board Secretary:** Edwin Lawson, M.D., 930 Hibernia Bank Bldg., New Orleans 12, La.

Maine

The Maine Board of Examiners in Chiropody and Podiatry. **Board Secretary:** Daniel A. Hanley, M.D., Box 637, Brunswick, Me.

Maryland

The Maryland Board of Chiropody Examiners. **Board Secretary:** Dr. S. Jack Kleger, 408 S. Division St., Salisbury, Md.

Massachusetts

The next board meeting of the Board of Registration in Chiropody-Podiatry will be held for reciprocity, conditionally, and examination, June and December, at Room 33, State House, Boston, Mass. **Board Secretary:** Robert M. Quinn, D.S.C., 16 South St., Pittsfield, Mass.

Michigan

The Michigan State Board of Registration in Chiropody will meet for examination in June of each year. **Board Secretary:** Dr. Albert G. Kalin, 24453 Grand River Ave., Detroit 19, Mich.

Minnesota

The Minnesota Board of Chiropody Examiners will meet for examination June 15, 16, 1961 at the State Capitol, St. Paul, Minn. **Board Secretary:** Dr. Palmer H. Goulson, 612 Southdale Medical Bldg., Minneapolis 10, Minn.

Mississippi

The Mississippi State Board of Health. **Board Secretary:** Archie L. Gray, M.D., Box 1700, Jackson, Miss.

Missouri

The Missouri State Board of Chiropody will meet April 28, 1961 in Jefferson City, Mo. **Board Secretary:** Frank Fulkerson, 611 Clay St., Chillicothe, Mo.

Montana

The Montana State Board of Chiropody-Medical Examiners will meet when the need arises for reciprocity or examination at the Capitol Bldg., Helena, Mont. **Board Secretary:** Dr. L. M. Jennings, 411 First National Bank, Bozeman, Mont.

Nebraska

The Nebraska State Board of Examiners in Chiropody. **Board Secretary:** Herman F. Gartner, D.S.C., First Natl. Bank Bldg., Lincoln, Nebr.

Nevada

The Nevada State Chiropody Board. **Board Secretary:** Dr. William A. Edwards, 150 No. Arlington St., Reno, Nev.

New Hampshire

The New Hampshire Board of Registration in Chiropody. **Board Secretary:** Edward W. Colby, M.D., 61 S. Spring St., Concord, N. H.

New Jersey

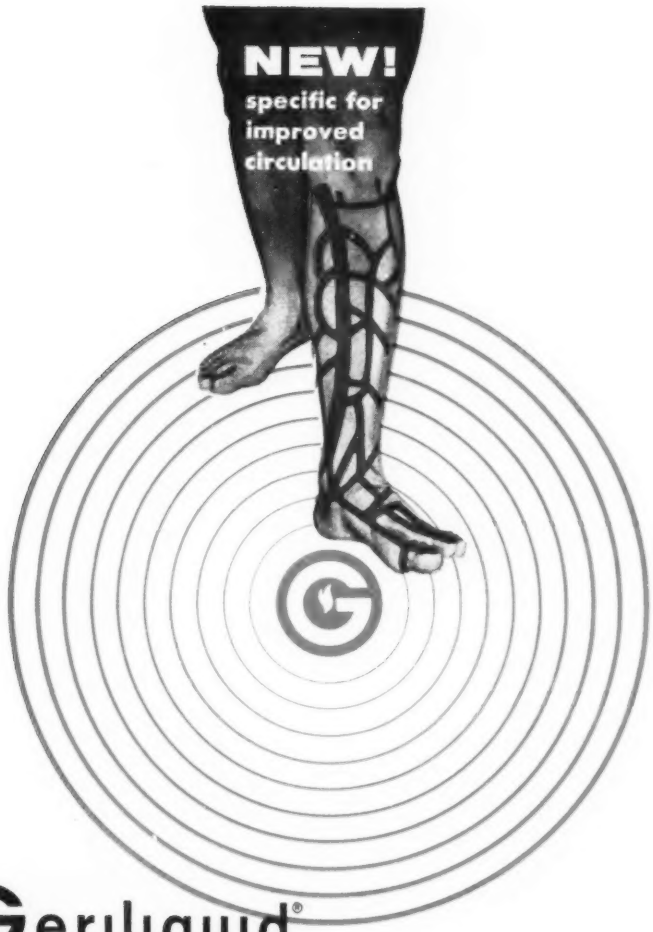
The New Jersey State Board of Medical Examiners meets semi-annually for examination on the third Tuesday, Wednesday, Thursday and Friday of June and October. **Board Secretary:** Royal A. Schaaf, M.D., 28 West State St., Trenton 8, N. J.

New Mexico

The New Mexico State Board of Podiatry will meet for examination July 15-16, 1961. **Board Secretary:** Morris Haas, D.S.C., 121 Sycamore St., N.E., Albuquerque, N. M.

New York

The New York State Board of Podiatry Examiners. **Board Secretary:** James O. Hoyle, Ed.D., 23 S. Pearl St., Albany, New York.



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State Board *(Cont.)*

North Carolina

The North Carolina State Board of Chiropody Examiners. **Board Secretary:** Robert W. Getchell, D.S.C., P.O. Box 796, Goldsboro, N. C.

North Dakota

The next board meeting of the North Dakota Board of Registration in Chiropody will be held for reciprocity and examination at call at 301 Black Bldg., Fargo, N. Dak. **Board Secretary:** Joseph E. O'Brien, D.S.C., P.O. Box 872, Bismarck, No. Dak.

Ohio

The Ohio State Medical Board. **Examiner in Chiropody:** H. M. Platter, M.D., 21 W. Broad St., Columbus, Ohio.

Oklahoma

The Oklahoma State Board of Chiropody will meet for examination when necessary, in June and September and other times as needed. **Board Secretary:** Dr. Warren D. Long, 1217 No. Walker St., Oklahoma City, Okla.

Oregon

Oregon State Chiropodists' Examining Board. **Board Secretary:** Richard H. Wilcox, M.D., 914 State Office Bldg., Portland, Ore.

Pennsylvania

Pennsylvania State Board of Chiropody Examiners will meet for examination in July, 1961, at the Education Bldg., Harrisburg, Pa. **Board Secretary:** Dr. Jack S. Pincus, 26 N. 3rd St., Harrisburg, Pa.

Rhode Island

The Rhode Island Board of Examiners in Chiropody. **Administrator:** Thomas B. Casey, 366 State Office Bldg., Providence, R. I.

South Carolina

The South Carolina Board of Podiatry Examiners will meet for reciprocity and examination at the discretion of the Board. **Board Secretary:** Dr. James D. Hill, 122 W. Whitner St., Anderson, S. C.

South Dakota

The South Dakota State Board of Chiropody Examiners will meet at the discretion of the Board. **Board Secretary:** Viola Marr, 115 N. Main Ave., Sioux Falls, S. D.

Tennessee

The Tennessee Board of Registration in Chiropody. **Board Secretary:** Stephen A. Lamm, 3355 Poplar Ave., Memphis, Tenn.

Texas

The Texas State Board of Chiropody Examiners. **Board Secretary:** Dr. Lewis M. Hoppock, P. O. Box 3315, Temple, Tex.

Utah

The Utah State Board of Chiropody Examiners. **Board Secretary:** Ward A. Burbidge, 1015 Medical Arts Bldg., Salt Lake City, Utah.

Vermont

Vermont Chiropody Association. **Board Secretary:** Gray S. Clark, Service Bldg., Rutland, Vt.

Virginia

Virginia Board of Medical Examiners. **Board Secretary:** Russell M. Cox, 509 Professional Bldg., Portsmouth, Va.

Washington

The Washington State Chiropody Examining Committee usually holds Basic Science and Chiropody examinations the first and/or second week in January and July at the University of Washington, Seattle, Wash. **Board Secretary:** Thomas A. Carter, Administrator, Department of Licenses, Olympia, Wash.

West Virginia

Medical Licensing Board of West Virginia. **Board Secretary:** N. H. Dyer, M.D., 1800 E. Washington St., Charleston, W. Va.

Wisconsin

The Wisconsin State Board of Examiners. **Board Secretary:** Roy M. Cowen, 2018 E. North Ave., Milwaukee 2, Wis.

Wyoming

The Wyoming State Board of Registration in Chiropody-Podiatry. **Board Secretary:** Dr. J. W. Scott, 21 East Works St., Sheridan, Wyo.

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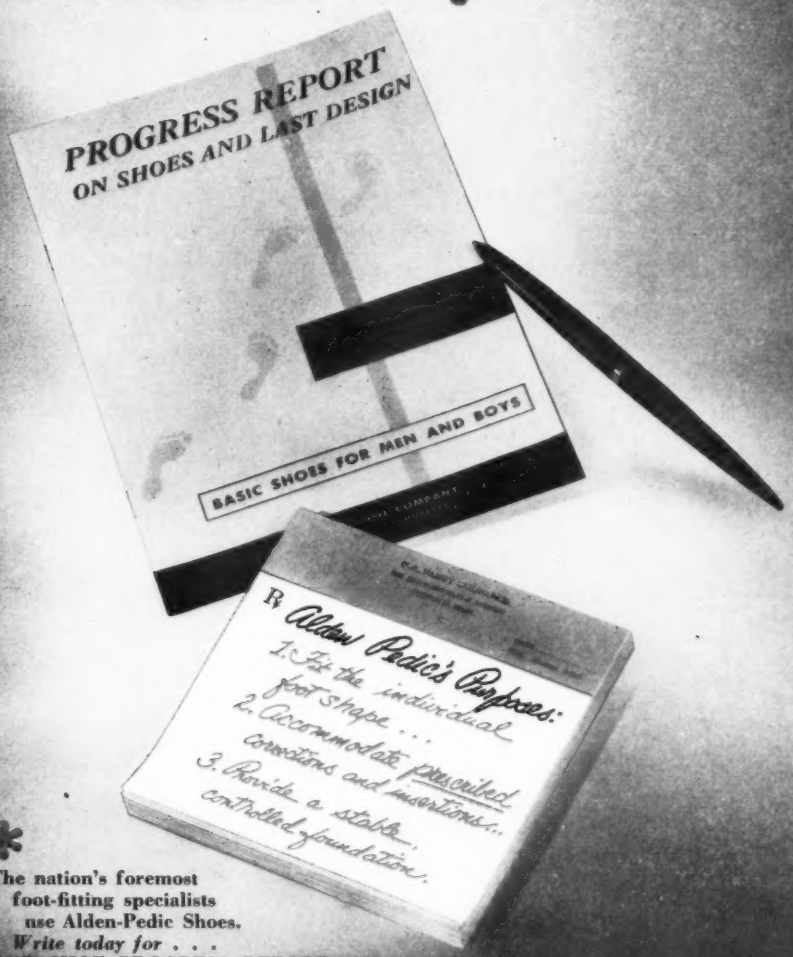
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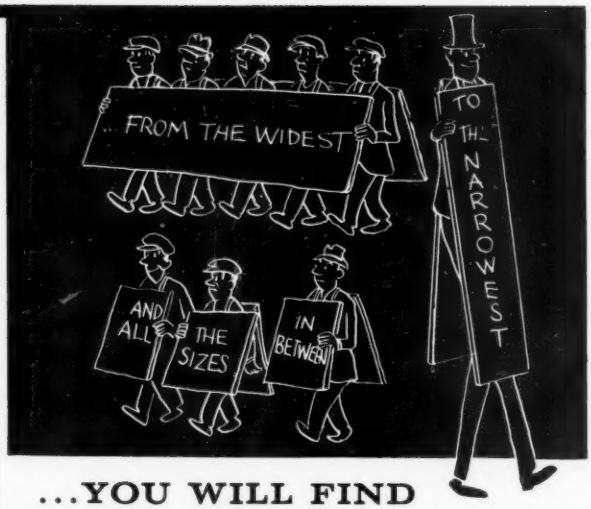

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PARTICIPATION IS LIMITED TO MEMBERS Of the American Podiatry Association and their immediate families residing in the same household.

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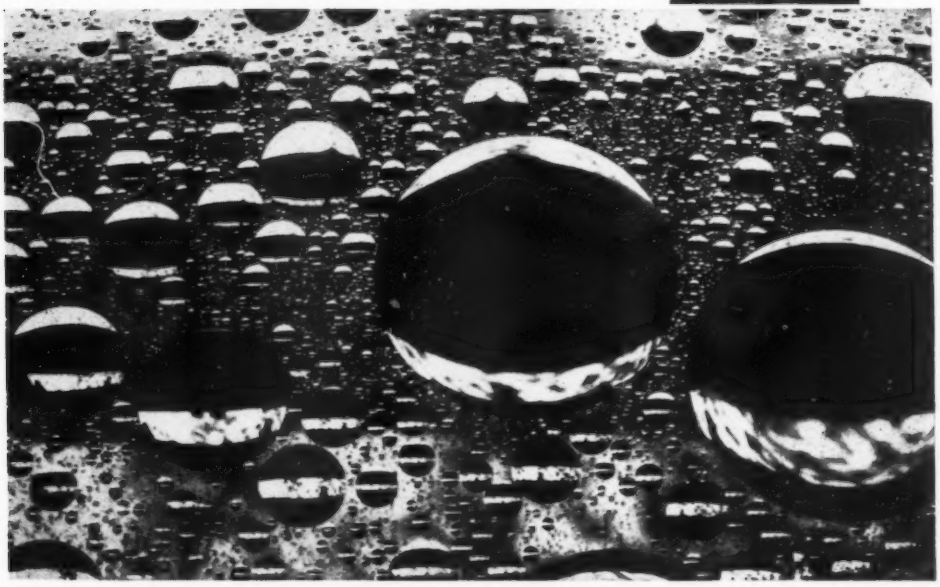

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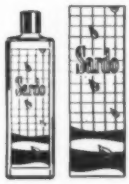

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1. Steinberg, M.D.: J. Amer. Podiatry Assn., June 1960.
2. Spoor, H. J.: N. Y. St. J. Med., Oct. 15, 1958.
3. Prentice, H. and Brezak, S.: J. Amer. Podiatry Assn., May 1958.

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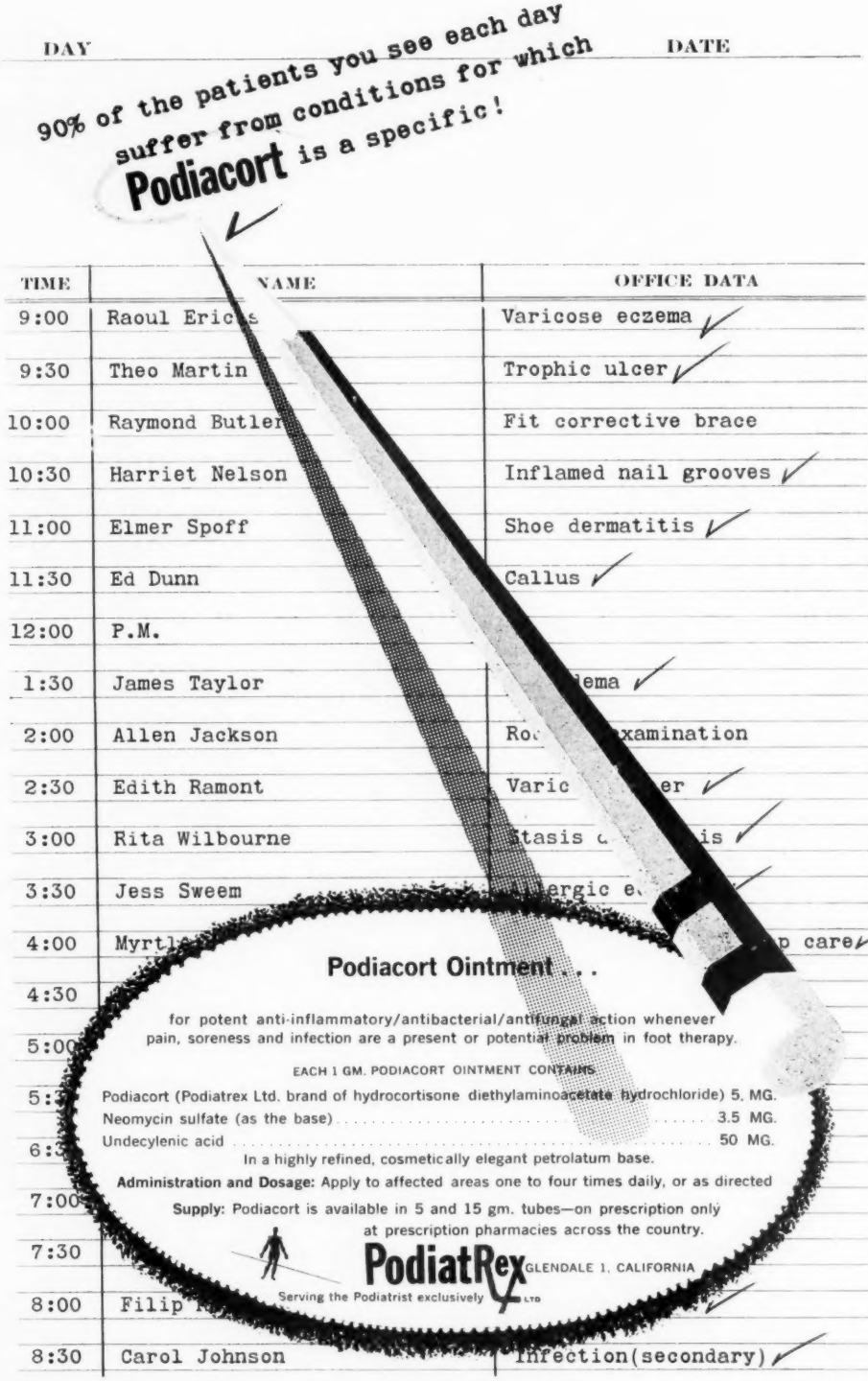
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11:00 Elmer Spoff
Shoe dermatitis
11:30 Ed Dunn
Callus
12:00 P.M.
1:30 James Taylor
ema
2:00 Allen Jackson
Ro xamination
2:30 Edith Ramont
Varic er
3:00 Rita Wilbourne
tasis c is
3:30 Jess Sweem
ergic e
4:00 Myrtl
p care
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8:00 Filip
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JOURNAL
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The Official Publication of the Podiatry-Chiropody Profession

VOLUME 51 FEBRUARY 1961 NUMBER 2

Griseofulvin in the Treatment of Tinea Pedis and Onychomycosis*

Milton E. Ashur, D.S.C.†
Reginald H. Farrar, M.D.††

TINEA PEDIS probably is the most common type of fungous disease. The infection may be acute (vesicular) or chronic (intertriginous, squamous, or hyperkeratotic) and may be complicated by secondary infection or superimposed dermatitis.[1] The acute disease is characterized by the presence of denuded fissures or vesicles, over honeycombed epidermis, between the toes and on the lateral and plantar aspects of the feet and toes. The lesions are edematous, pruritic, painful, and odorous. Secondary dermatophytid eruptions can occur on the hands and wrists. The vesicles often coalesce into bullae and exude a clear or reddish fluid; if a secondary pyogen is present, the bullae contain purulent yellowish material which may ulcerate. Localized or extensive cellulitis may be present and eventually cause generalized lymphangitis and inguinal lymphadenopathy.

Chronic tinea pedis is characterized by white, odorous epidermis or hyperkeratotic plaques, occasionally with peripheral vesicles, on a moist and erythematous base. Hyperhidrosis is usually present; however, if all the interdigital spaces are involved, the disease probably is not tinea. When the fungous infection is of long duration, sharply defined hyperkeratosis is seen on the heels which become thick and dull red. There is scaling but no vesicles. Pruritus is intense. A rare type of tinea pedis, without vesicles or bullae, occurs on the heels, soles, and sides of the feet. The well-demarcated lesions, which often occur symmetrically on both feet, are branny, erythematous, and hyperkeratotic. There is little or no pain or pruritus.

Tinea pedis usually is not transmitted by personal contact but indirectly through contaminated articles, such as shoes and socks, which can become the source of persistent reinfection.[2] Hyperhidrosis and poor hygiene are exacerbating factors.[1]

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It has been estimated that 18 percent of all diseases of the nail are of fungous origin.[3] Onychomycosis is due to dermatophytes (usually trichophyton but occasionally epidermophyton), favus, or yeasts (Candida). The disease is more common in adults than in children and occurs more often on the toenails than on the fingernails.[3]

Clinically the nails appear thickened, discolored, brittle, and friable. The surface is pitted and furrowed and the ends are ragged. The nail is lifted from its bed and there is subungual debris. Inflammation is not common except in infections due to C. albicans. The infection begins at the distal portion of the nail and progresses inward toward the matrix.

It is impossible to base a differential diagnosis of onychomycosis purely on clinical evidence.[3] Psoriasis, post-traumatic or postinfectious onychogryphosis, paronychia of bacterial origin, eczema, and moniliasis are types of nonfungous nail pathology which clinically resemble dermatophyte infections. The differential diagnosis is further complicated by the fact that the presence of nonpathogenic fungi may provoke false positive results of laboratory studies.[3]

Despite avulsion of the affected nail or long periods of roentgenographic therapy, the prognosis in onychomycosis was, until recently, poor.[4-6] It is not unusual to see patients who have had the infection for several decades.

Topical agents are of dubious value in the treatment of tinea of the skin and of no value at all in onychomycosis since they cannot penetrate the keratin in sufficient concentration to arrest the growth of the fungi.[7] It was recognized that an antimycotic agent for oral administration would overcome this limitation.

Clinical Pharmacology

In 1933 Raistrick and Simonart[8] reported on a product, gentisic acid, found in glucose metabolism of Penicillium griseofulvum dierckx; in 1939 Oxford and colleagues[9] isolated griseofulvin as a metabolic product of this species. Since the metabolite did not possess the antibacterial activity which was then being sought, it was ignored for several years and then used only as an antimycotic agent for plants. In 1947 Brian[10] reported isolation of a product, also from species of Penicillia, which he called the "curling factor" because it caused the nomally straight hyphae of fungi to become distorted. Grove and McGowan[11] showed that the Oxford and Brian substances were identical. Later, Lauder and O'Sullivan,[12] Gentles,[13] and Martin[14] cured mycotic disease in animals with griseofulvin. These studies stimulated the experimental use of oral griseofulvin to treat fungous disease in the human. The early favorable reports by Riehl,[15] Williams and colleagues,[16] and Blank and Roth[17] began what has since become a profuse literature attesting to the efficacy of griseofulvin in fungous infections of the hair, skin, and nails.[18-37]

Griseofulvin is a white thermostabile powder slightly soluble in water. In solution it withstands autoclaving without loss of potency and in the dry form it is stable for 20 months at 38° C. It is active against species of Trichophyton (interdigitale, mentagrophytes, rubrum, schoenleini, tonsurans, and verrucosum); Microsporum (audouini, canis, and gypseum), and Epidermophyton floccosum.[17] These saprophytes are responsible for nearly all cases of fungous disease. The development of resistant strains of some of these fungi *in vitro* has been reported[22, 25, 36] although clinically this has not been a problem. The drug is not active against Candida albicans (moniliasis) or Malassezia furfur (tinea versicolor) and, although there has been some evidence to the contrary, is generally considered ineffective for systematic infections.[30] It is of no value in nonfungous dermatoses.

Griseofulvin should not be used when a moniliasis is associated with the dermatophyte infection. Although Walker[37] reports that five of his patients with C. albicans infections improved during griseofulvin therapy, the consensus is that the drug should not be used for this disease

since it is of no benefit and may be exacerbating.[16, 17, 18]

Griseofulvin apparently is absorbed from the gastrointestinal tract and deposited by the dermal cells in the hair, nails, and keratin layer of the skin. Fungistatic levels of griseofulvin have been recovered from the hair of treated guinea pig.[38] Griseofulvin, by incorporation into keratin, halts the growth and reproduction of the saprophytes so that they cannot invade the new keratin layer as it emerges. The arrester fungi are sloughed off with the parasitized keratin and the new tissues are free from infection.

Clinical side effects have been reported by some investigators. Transient headache or gastrointestinal disturbance is not uncommon but these symptoms disappear spontaneously after a few days of therapy and therefore reduction or premature discontinuance of the drug is not necessary.[17, 32] Very rarely an urticarial reaction occurs which requires that therapy be discontinued.

Paget and Walpole[39] reported that very high (200 mg./kg.) parenteral doses of griseofulvin produced, in rats, interference with mitosis and spermatogenesis; however, oral administration in the human has not been found to affect spermatogenesis[40] and, in general, blood and urine studies performed by clinical investigators indicate that administration of griseofulvin usually does not affect normal values. Livingood and colleagues[41] and Reiss and colleagues[18] have reported infrequent transient albuminuria. McCuistion and colleagues[42] found an occasional right shift in the peripheral blood count during therapy and an occasional rise in the leukocyte count some weeks after discontinuance; Pipkin,[43] however, found occasional instances of slight leukocytic depression. These variations in physiologic values were not considered significant since they did not greatly exceed normal limits and also disappeared spontaneously. Thus far no permanent ill effects from griseofulvin have been reported. Because griseofulvin does not possess antibacterial activity, its use systematically will not affect the normal flora of the gastrointestinal tract.[44]

Methods

For the past year, we have been using griseofulvin to treat tinea pedis and onychomycosis. We did not administer the drug to patients with acute or slight cases of tinea pedis since Burow's solution, or a weak solution of potassium permanganate, is sufficient therapy. Griseofulvin was used only for extensive or chronic cases of tinea pedis which were resistant to routine topical care.

Tinea pedis was present in 55 males and 49 females ranging in age from 12 to 76 years. The infecting organism was T. rubrum in 83 cases, T. mentagrophytes in 17 cases, and E. floccosum in 4 cases. The duration of infection ranged between 2 months and 30 years. The dosage, divided, was 1,000 mg. daily.

Onychomycosis was present in 32 males and 24 females ranging in age from 21 to 73 years. The infecting organism was T. rubrum in 47 cases and T. mentagrophytes in 9 cases. The duration of infection ranged between 10 months and 30 years. Weekly or biweekly, the nails were abraded and thinned with sandpaper burs on a dental drill. (The sandpaper is superior to steel or diamond burs because it generates less heat and therefore less pain and, being disposable after each use, avoids any risk of contamination to the next patient.) Although Frost[45] suggests avulsion of the infected nail, we did not follow this procedure since we believe this further traumatizes an abnormal nail bed and increases the possibility of eventual hypertrophy of the noninfected nail.

Originally our patients received one 250 mg. tablet four times daily but later, for convenience, two tablets were taken postprandially twice daily. The total daily dosage of 1,000 mg. was gradually reduced to 750 or 500 mg. daily as improvement progressed; occasionally only 250 mg. daily was given. However, continued experience

TABLE I
Diagnoses and Results

Tinea pedis: 104 patients				Onychomycosis: 56 patients			
Infecting organisms		Result		Infecting organisms		Result	
T. rubrum	83 (80%)	Cured:	91 (87%)	T. rubrum	47 (84%)	Cured:	39 (70%)
T. mentagrophytes	17 (16%)	Improved:	9 (9%)	T. mentagrophytes	9 (16%)	Improved:	5 (9%)
E. floccosum	4 (4%)	Failure*:	4 (4%)			Failure*:	12 (21%)

indicated that the dosage of 1,000 mg. daily should be used for the entire period of therapy, and this is our present practice. Treatment was continued for 2 weeks after cure of tinea pedis and for 4 to 6 weeks after cure of onychomycosis.

Microscopic examinations and cultures were used to verify each tentative clinical diagnosis of fungous disease. The skin or nail was first cleaned thoroughly with a solution of 70 percent alcohol[46] and then deep specimens were taken to bypass material which had been contaminated by bacteria.[3]

Slides for microscopic examination were prepared after the method of Cohen[47] as follows: 10 cc. of a superchrome blue-black ink is added to 20 cc. of a 20 percent solution of potassium hydroxide. Biopsied material from the vesicles or scales on the foot or from clippings or subungual debris of the nail is placed on the slide with two drops of the staining solution. Nail clippings are kept in solution for a few hours to dissolve keratin. A cover slip is applied and the excess liquid is removed with a blotter. After 15 minutes the slide is viewed under low and high magnification and the stained hyphae can be recognized easily. The presence of these mycelial elements confirms the diagnosis of fungous invasion[3] but does not permit identification of the specific pathogen, for which cultures are necessary.

Cultures were made by inoculating the medium (Sabouraud's dextrose agar) in a flask with biopsied material.[48] After approximately 10 days at room temperature, the fungi, if present, will flower into identifiable patterns.

All patients received complete blood counts and urinalyses before and after treatment. If patients were treated for 5 months or longer, complete blood counts were taken every month and urinalyses were performed weekly or biweekly. A total of 302 blood counts and 941 urinalyses was performed.

Therapeutic Results

Table 1 summarizes the diagnoses and results among the entire series.

In tinea pedis, pruritus usually disappeared within a few days after therapy had been started. Since no double-blind studies with a placebo were performed, the possibility of a "placebo effect" must be considered; however, we believe that the marked antipruritic effect actually was due to the drug.

Of 104 patients with tinea pedis, 91 have now been discharged as cured. There was no correlation between the duration of the infection and the time required for cure. Nine patients have improved significantly and are still under treatment. Four patients who failed to show significant improvement after 4 weeks of treatment were reevaluated and complicating factors (usually psoriasis, eczema, atopic dermatitis, or moniliasis) were found invariably.

Of 56 patients with onychomycosis, 39 have been discharged as cured, 5 have improved considerably and are still under treatment, and 12 were discharged without cure. If there was no substantial improvement at the end of 5 months of treatment with griseofulvin, the patient was reevaluated. Failure to respond to an adequate duration of treatment with griseofulvin invariably was due to complication by other pathology. Of the 12 patients with cultures positive for tinea rubrum who failed to respond to therapy, 6 also had psoriasis, 4 also had eczema, and 2 also had atopic

TABLE 2
Times Required for Cure

Tinea pedis; T. rubrum		Tinea pedis; T. mentagrophytes		Tinea pedis; E. floccosum		Onychomycosis; T. rubrum		Onychomycosis; T. mentagrophytes	
Duration of therapy in weeks	Number of patients cured	Duration of therapy in weeks	Number of patients cured	Duration of therapy in weeks	Number of patients cured	Duration of therapy in months	Number of patients cured	Duration of therapy in months	Number of patients cured
1	—	1	—	1	—	3	—	3	1
2	12	2	1	2	1	4	—	4	1
3	8	3	1	3	—	5	—	5	—
4	3	4	1	4	—	6	3	6	—
5	2	5	—	5	2	7	2	7	—
6	12	6	1	6	1	8	4	8	2
7	19	7	3	7	—	9	5	9	1
8	4	8	4	8	—	10	10	10	—
9	19	9	—	9	—	11	4	11	—
10	7	10	—	10	—	12	5	12	1
Total cures: 76		Total cures: 11		Total cures: 4		Total cures: 33		Total cures: 6	
Averages		Averages		Averages		Averages		Averages	
Mean: 7 weeks		Mean: 6 weeks		Mean: 4½ weeks		Mean: 9 months		Mean: 7 months	
Median: 6 weeks		Median: 5 weeks		Median: 4 weeks		Median: 9 months		Median: 7½ months	
Mode: 7 and 9 weeks		Mode: 8 weeks		Mode: 5 weeks		Mode: 10 months		Mode: 8 months	

dermatitis. These patients all showed some improvement initially but this did not continue at the expected rate and the associated pathology was discovered at the re-evaluation examination.

The treatment of onychomycosis is time consuming. There is usually considerable resistance to therapy, especially during the first few months, but if there is a positive diagnosis and no associated pathology, the long-term prognosis is excellent. Usually 9 months, and occasionally 12 months, of treatment were required although some patients were cured after shorter periods of therapy. Improvement, manifested as clear areas at the base of the nail, usually was observed after 14 weeks; as therapy progressed, clearing gradually extended to the distal portion of the nail. At the conclusion of successful therapy, half of the nails usually appeared perfectly clear clinically while others were hypertrophied or furrowed or both. Cure was considered complete when there was no clinical evidence of fungous invasion and when several laboratory examinations were negative. The hypertrophy or furrowing which sometimes remained after the fungous infection had been cleared probably is due to permanent damage to the nail bed sustained during the period of active infection. This is similar to the irreversible hypertrophy of traumatized nails.

Table 2 shows the times required for cures among the entire series.

Since we found that healing did not progress satisfactorily with doses of less than 750 mg. daily, we now use only the higher doses. It appears that optimal results are obtained when the daily dose is at least 750 mg. and preferably 1,000 mg.

Thus far none of our patients has relapsed; however, the follow-up period has been too brief to permit a definite statement that the patients have been cured permanently. In onychomycosis, a follow-up period of one year is desirable before definite conclusions are drawn.

Side Effect

A total of 30 transient side effects occurred in 16 patients. The incidence was as follows: headache, six; upper respiratory infection, four; constipation, two; cough, two; diarrhea, two; general malaise, two; nasal congestion, two; nausea, two; urticaria, two; vague abdominal discomfort, one; bloating, one; dark urine, one; insomnia, one; skin

rash, one; vomiting, one. When a patient reported a side effect, griseofulvin was discontinued for three days to two weeks and then resumed; invariably, the side effect did not recur although therapy usually was resumed at the previous level. These side effects are difficult to evaluate since any of them can occur in generally healthy patients not under drug therapy. Two of our patients had histories of severe reactions to penicillin but tolerated griseofulvin without difficulty. A patient with a duodenal ulcer took griseofulvin without gastrointestinal or other symptoms.

The blood counts showed a range of variation of the erythrocytes of from 3,950,000 to 5,850,000 per cu. mm.; of hemoglobin from 12.4 to 16.8 grams per 100cc.; and of the color index from 0.85 to 1.07. The total leukocytes ranged between 4,500 and 8,300 per cu. mm. differentiated as follows: polymorphonuclear neutrophils from 65 to 72 percent; lymphocytes from 23 to 32 percent; and eosinophils from 1 to 2 percent.

The results of the urinalyses indicated a range of variation of the protein fraction from zero to 30 mg.; the pH ranged between 5 and 8, and the specific gravity between 1.008 and 1.002. Only one of the patients in our series is a known diabetic. Ten of the total number of analyses showed "trace" amounts of sugar but no consistent or significant glycosuria was found in any patient.

These values can be considered within normal limits since the minor variations are not clinically significant. While it now appears to be unnecessary to perform these studies as often as has been our practice, it is desirable to make tests at the beginning and end of short-term therapy and at intervals when the treatment period is relatively long. It may also be desirable to perform follow-up studies several months after discontinuance of therapy.

Conclusion

Griseofulvin will cure tinea pedis and onychomycosis caused by Trichophyton and Microsporum if there is no moniliasis or superimposed nonfungous pathology and if treatment with 750 or 1,000 mg. daily is continued at least until there is unequivocal clinical and laboratory evidence of cure. Failure to respond to griseofulvin can be considered presumptive evidence of inaccurate diagnosis or complicating factors.

Although our experience, and that of other investigators, indicates that toxic reactions to griseofulvin are unlikely, the possibility of their occurrence should not be ignored. It is impossible to treat large numbers of patients with any potent drug without finding at least occasional instances of toxicity, if only as an idiosyncratic reaction. If one is alert to the possibility of toxic reactions, takes proper precautions to keep dosage and duration of therapy to the minimal effective level, and performs regular and thorough laboratory tests, griseofulvin can be used without fear of serious consequences.

Summary

Griseofulvin, 1,000 mg. daily, was used to treat 104 patients with tinea pedis and 56 patients with onychomycosis. The infecting organism was Trichophyton mentagrophytes or rubrum, or Epidermophyton floccosum. Of the patients with tinea pedis, 91 have been cured and 9 substantially improved; of the patients with onychomycosis, 39 have been cured and 5 substantially improved. Tinea pedis usually was cured within 2 months and onychomycosis within 12 months. The patients who did not benefit from griseofulvin invariably had associated moniliasis or nonfungous pathology. The clinical side effects were mild and transient, and no pathological changes were noted after regular examinations of the blood and urine.

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(References continued on page 140)

Clinical Evaluation of "Diphenylpyraline"* as an Antifungal Agent in Tinea Pedis —A Preliminary Report

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TINEA PEDIS has long presented many treatment problems to the podiatrist, especially where a topical agent is to be used. The dermatologic changes range from localized irritation and inflammation to secondary infection and dermatophytid reactions. The average patient is more concerned with the itching, scaling, and maceration of the feet than with an underlying orthopedic defect or the pedal manifestation of some systemic disease. Therefore, prompt and effective relief of symptoms and treatment of this clinical entity are necessary to gain the patient's confidence.

Reports have indicated that "diphenylpyraline"* (1-methyl-piperidyl-4 benzhydryl ether) had marked in vitro antifungal action against the common fungi of tinea pedis: Trichophyton rubrum, Trichophyton mentagrophytes, Epidermophyton floccosum, and Candida albicans. These reports suggested that clinical studies be instituted to corroborate these findings. It has long been the feeling of the author that basic clinical podiatric research much be undertaken by our profession.

Except for the use of culture techniques and microscopic studies, such as the use of the standard Sabouraud agar media, to check the clinical diagnosis, this study was entirely clinical. The chemical, pharmacologic and physiologic aspects of "diphenylpyraline hydrochloride" 2%, will not be discussed in this paper.

Only those patients whose clinical diagnosis of tinea pedis was confirmed by laboratory studies were included. The medication was not used for the treatment of onychomycosis nor were patients permitted to use the drug longer than 28 days. It has long been felt that a good pharmacologic agent must relieve the patients' symptoms quickly, clear the lesions, and not produce any side or untoward reactions.

The pathologic changes involved in tinea pedis are due to inflammatory changes within the keratinized layers of the epidermis and not body invasion by the fungi. The stages of inflammation vary from reddening, scaling, vesiculation, crusting and ulceration to secondary infection due to bacterial invasion. The more superficial portions of the epidermis are usually involved or attacked by the fungi.

Each patient was questioned as to the disease process, symptoms, treatment, past and present, drug sensitization, past infections and related skin diseases.

The lesions were classified as follows:

1. Squamous – characterized by degree; scaling with or without discoloration.
2. Hyperkeratotic – characterized by a thickening and hornification of the skin.
3. Intertriginous or interdigital – characterized by fissure formation, with or without maceration.
4. Vesicular–
   a. Sub-acute – characterized by the formation of small slate-gray vesicles with little or no inflammation.
   b. Acute–characterized by inflamed vesiculation with a greater chance of secondary infection.

In many texts the squamous type has been classified as part of the hyperkeratotic variety, but for the purpose of this study, the differentiation was made to distinguish between the superficial scaling and the hornification of the epidermis.

It is felt that the results of the use of an antihistamine, such as "diphenylpyraline hydrochloride" 2%, in the treatment of tinea pedis may be due to the action against

*"Diphenylpyraline Hydrochloride" 2% used in this study was supplied by the Cooper, Tinsley Laboratories, Harrison, N. J., as "Cupertin" Cream.

†St. Luke's & Children's Medical Center, Department of Podiatry.

TABLE I
Results of Treatment

Age Sex Race	Clinical Diagnosis	Organism	Previous Treatment	Anti-pruritic Action	Anti-inflammatory Action	Antifungal Action	Days to Clear Lesion	Side Reactions	Comments
29-M-N	4b	TM	N	C	C	C	25	S	Secondary infection
40-F-W	1	TR	P	C	C	C	20		
25-F-W	4a-3	TM	P	P	P	C	17		
38-F-W	4a-3	TM	N	P	P	P	28	S	Secondary infection with ids
55-F-W	1-3	TR	N	C	C	C	18		
40-F-W	3	TM	P	C	C	C	24		
60-F-W	1	TR	N	P	P	P	28		
72-F-W	1-3	EF	N	C	C	C	15		Diabetic
73-M-W	1	TR	N	C	C	C	12		
41-F-W	3	TM	N	C	C	C	22		
68-F-W	1	TR	P	C	C	C	20		Ids
64-F-W	1	TR	P	C	C	C	23		
42-F-N	2	EF	N	P	N	N	28		
69-M-W	1	TR	N	C	P	C	21		Diabetic
52-F-W	3	TM	N	C	P	N	28		
39-F-W	3	TM	N	P	P	P	20		
26-F-W	4a	TM	N	C	C	P	28	S	
67-F-W	4b	TM	N	C	C	C	24	S	Diabetic with secondary infection
72-M-W	4b	MA	N	C	C	C	25	S	Diabetic with secondary infection and ids
63-F-N	1	TR	P	C	C	C	17		
36-F-W	1	TR	N	C	C	C	20		
42-F-W	1	TR	N	C	C	C	21		
63-M-W	3	TM	P	P	P	P	28		
46-F-W	3	TM	P	C	C	C	24		Diabetic
62-F-W	1	EF	N	P	N	N	28		
18-F-W	4a	TM	N	C	P	C	21		
42-F-N	1	TR	P	C	P	C	26		
37-F-W	3	TM	N	C	C	C	20		
47-F-W	1	TR	N	C	C	C	18		
46-F-W	2	TR	N	P	N	P	28		
47-F-N	3	EF	P	C	C	C	22		
40-F-N	1-3	TM	N	C	C	C	24		
67-F-W	4a	TM	P	C	P	C	26	S	Diabetic
51-F-W	1	TR	N	C	P	C	28		
26-F-W	4b	TM	N	C	C	C	20	S	
69-F-W	3	TM	N	C	C	C	23		
51-F-W	1	TR	N	P	N	N	28		
37-M-W	4a	TM	N	C	C	C	20		Ids
50-M-W	2	EF	N	C	C	C	17		
25-M-W	3	TM	P	C	P	C	23		
37-M-N	1	TR	N	C	C	C	16		
37-M-W	1-3	TM	N	P	N	P	28		
52-F-W	1-3	TM	N	C	C	C	19		
50-M-W	1	TR	P	C	C	C	17		
63-F-W	4a	TM	P	C	P	C	20		Diabetic
35-F-N	4b	TM	N	C	C	C	15		Ids
68-F-W	1	TR	N	P	C	C	27		
76-M-W	1	TM	P	C	P	C	23		Diabetic
61-F-W	4b	MA	N	N	N	N	28	S	Secondary infection
67-M-W	3	TM	N	P	N	P	28		
62-F-W	1	TR	N	C	C	C	18		
67-M-W	1-3	TR	N	C	P	C	26		

Code: C—Completely effective
P—Partially effective
N—No effect or not treated
S—Stings with initial application

Clinical Diagnosis
1—Squamous
2—Hyperkeratotic
3—Interdigital
4a—Subacute vesicular
4b—Acute vesicular

Organism
TR—Trichophyton rubrum
TM—Trichophyton mentagrophytes
EF—Epidermophyton floccosum
MA—Monilia albicans

a localized allergy and the intolerance to the various types of ointment bases. It also must be stated that reinfection is common in tinea pedis. The known complications of tinea pedis are: contact dermatitis, dermatophytid reaction, secondary infection, eczematization, and onychomycosis.

Method of Treatment

Following the culture, clinical and laboratory diagnosis of all reported cases, each patient was given a tube or container of Cupertin® cream, containing diphenylpyraline hydrochloride, 2%, in a nonstaining, water-washable base. The reported pharmacologic actions of the drug are: (*a*) antifungal, and (*b*) antipruritic. The reported incidence of sensitivity to the drug has been quite low. Each patient was instructed to apply a thin coat of the medication over the affected area twice daily. The patient used no other medication during the time of Cupertin treatment and patients were seen once or twice a week, depending upon the severity of the condition.

The criterion for cure was based on the complete cessation of itching and the absence of scales and vesicles.

Diphenylpyraline 2% did not have any untoward effect on the diabetic patients treated. Those patients who presented id reactions were instructed to apply the medication to the pedal lesions and to the ids. Those patients who presented secondary infection were treated with antibiotic and warm saline soaks to first control the bacterial infection.

Summary of Results

A total of 52 patients used diphenylpyraline hydrochloride 2% for tinea pedis. The majority of the skin lesions were the scaly type with itching being one of the chief complaints. It was interesting to note that the Trychophyton variety comprised the major portion of the causing organisms.

Antipruritic action — Of the patients treated, 40 demonstrated complete cessation of itching, 11 reported improvement and 1 exhibited no effect from the drug.

Anti-inflammatory action — Burning and associated pain was completely relieved in 30 patients, 15 reported partial relief, 7 reported no change. It was also noted that some of the associated discoloration of the skin adjacent to the lesions did not completely resolve even after all the lesions had cleared.

Antifungal action — Complete clearing of the lesions was shown in 39 cases, 8 showed partial clearing and 5 exhibited no effect by the drug.

The average duration of treatment was 22 days. The only side reaction noted (8 cases) was a slight stinging when applied to a denuded area.

It was noted in this study that 90 percent of the patients treated demonstrated clinical improvement. The antipruritic action of the drug was almost dramatic. From the results of this study, it is evident that diphenylpyraline hydrochloride is a new and valuable agent, not only from the treatment of tinea pedis, but also as an antiinflammatory and antipruritic agent. Additional clinical studies should be undertaken to corroborate these findings, especially studies in the field of allergic dermatology.

It is the feeling of the author that by relieving the itching sensation, the patient did not touch the lesions by scratching, and thus permitted the involved areas to heal.

Diphenylpyraline hydrochloride (Cupertin Cream) is a valuable addition to the therapeutic armamentarium of the podiatrist.

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Philadelphia, Pa.

® Cooper, Tinsley Laboratories.

(Bibliography continued on page 141)

Code: C—Completely effective; P—Partially effective; N—No effect or not treated; * Same with initial application
Clinical Diagnosis: 1—Squamous; 2—Hyperkeratotic; 3—Interdigital; 4a—Subacute vesicular; 4b—Acute vesicular
Organism: TR—Trichophyton rubrum; TM—Trichophyton mentagrophytes; EF—Epidermophyton floccosum; M A—Monilia albicans

A Study of Griseofulvin as Related to Tinea Pedis*

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Mode of Action

TINEA PEDIS shows different degrees of local symptomatic response on the feet. This response varies with the type and virulence of the causative organism, the anatomical location of the invasive site and the tissue immunity.[1] The podiatrist's job in treatment is primarily to attain three distinct goals: (1) to mechanically remove foci of infection, (2) to chemically destroy living parasites within reach, (3) and to aid the body in the process of repair of damage by the fungi.[2] Finally a fourth can be added to these goals: to create an environment in the integument that is so abhorrent to the growth of fungi that parasitic life could not possibly be supported. This last is the function of griseofulvin.

Desai said: "Based on the studies of the evolution of experimental lesions, of cultures from the evolving lesions, of the morphology of the fungus in different types of lesions and of family contacts, we came to the conclusion that there are four essential factors which have to be present to produce clinical dermatomycoses. These factors, in numerical order, are: (1) Hyphal elements of the fungus must be present. The growth of hyphae constitutes the active phase of clinical dermatomycoses and not the spores. You may find spores in the infected area for a long time although there is no clinical evidence of disease. (2) organism must be at the deeper zones in the epidermis where the new keratin is being formed, and there has to be deep inoculation to produce symptoms of dermatomycosis. (3) Moisture must be present. Unless there is adequate moisture the hyphal elements will not grow, and they may terminate in spores with cessation of symptoms of the disease. (4) The active growth of the mycelial phase is supported by some 'fungal nutrient' which is generated in the course of keratinization. Clinical dermatomycosis will occur only if all of these four factors are present simultaneously. Absence of one or another of the factors may terminate the disease or may prevent the development of an active disease.[3]

Griseofulvin, administered orally, is specifically active against the superficial fungi which cause ringworms of the feet and nails. It is a serum-borne substance previously used in agriculture which has a confining and static effect on these dermatophytes.[4]

Ormsby says that the involvement of the skin by the ringworm fungus produces a certain amount of inflammatory reaction, which causes dilatation of the superficial blood vessels of the corium and a hyperplasia of the cellular elements.[5] With the ingestion of griseofulvin the drug is absorbed by the blood stream where it is incorporated with a cellular exudate as described by Peck[6] occurring in the papillary and subpapillary cutis, chiefly directly beneath the vesicles, the infiltrating cells for the most part being polymorphonuclear cells and lymphocytes. As these cells move toward the stratum corneum from the stratum lucidum either by the wearing-out process of the corneum layer or by the actual leukocytic infiltration, they have absorbed griseofulvin by osmosis in sufficient quantity to create a fungistatic condition.

McNall[7] says that the time course of griseofulvin concentration in blood depends considerably on its route of administration and dosage level. When the drug is administered orally a slow rise of blood griseofulvin concentration is observed which may first be detected between five and eight hours, and is followed by a slow decline. Intraperitoneally administered griseofulvin rapidly reaches saturation levels within a half hour to one and one-half hours and

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remains at saturation levels for a period dependent on the initial dosage.

He also says that griseofulvin is quite well absorbed, although the absorption pattern is relatively slow in humans taking the drug by mouth. Following a single oral dose of 1 gm. (70-80 mg./kg. of body weight), maximum serum levels are reached in three to eight hours. Twenty-four hours after a single dose, the drug is virtually absent in blood; levels are down to one microgram or less. In rats a single intraperitoneal injection brings griseofulvin up to maximum levels in one hour, and it persists in the blood well beyond 24 hours.[8]

At one time griseofulvin was called the "curling factor" as indeed it causes an actual curling and stunting of the hyphae of the fungi.[9] The fungi coalesce into themselves forming a tight knot of multi-branched hyphae. As further keratinization takes place and more of the griseofulvin containing skin cells reach the outer surface of the epidermis, the fungus disease is arrested in its growth. The outer skin sloughs off as keratinization continues and eventually non-infested cells replaced infected keratin.

Roth and Blank studied the primary occurrence of griseofulvin in the Stratum corneum and its subsequent transport to the skin surface. Macroconidia of Microsporum gypseum were applied directly to intact skin and to areas stripped progressively to the glistening layer by pressure sensitive tape. In normal subjects a continuous inhibition in the length of the developing germ tubes was observed as the horny cell layers were removed. Griseofulvin failed to prevent germination of the spores in both the in vivo and in vitro situations. Hyphal abnormalities and "curling" were produced in the germinating spores at the glistening layer after 48 to 72 hours of therapy. The time required for the antibiotic to be transported through half the thickness of the stratum corneum varied with the subject and appeared to be determined by the thickness of the epidermal layer and the rate of formation of new cornified cells. In nine subjects the attainment of the midpoint ranged from 11 to 19 days. As measured by effect on initial hyphae, griseofulvin became progressively more difficult to detect past the middle region and minimal effects were observed at the superficial layers even in patients on therapy as long as seven weeks.

Since no known externally applied antifungal agent could penetrate into the hard keratinous structures of the skin except perhaps for copper sulfate iontophoresis[11] it was recognized that an antifungal agent must be discovered that could be given systemically. This agent, griseofulvin, attacks the invading organisms by bathing the hard keratinous structures in sufficient concentration to be lethal.[12]

The Properties of Griseofulvin

The empirical formula of griseofulvin is $C_{17}H_{17}O_6Cl$. The structural formula has been worked out by Grove, et al.[13, 14]

It is obtained as a white powder that is heat stable with a bitter aftertaste. It is soluble in water to 0.001%, in ethyl alcohol to 0.1%, in chloroform to 4.4%, in acetone to 5%, in white mineral oil to 1% and in dimethylformamide to 12%. It is stable in its dry form for 20 months at 38°C. and also occurs as needle-like crystals. It is a fermentation product of Penicillium griseofulvum Dierckx, and of P. patulum and P. janczewski.[15, 16, 17, 18]

The History of Its Discovery

The antibiotic, antifungal agent was first discovered in England in 1939 by Oxford, Raistrick and Simonet.[19] In the years between 1949 and 1959 numerous papers were published in the basic science journals by Brian and his cohorts concerning its usefulness in managing diseases of plants and vegetables, especially lettuce and tomatoes.[20, 21, 22, 23] At a round table discussion on griseofulvin, Dr. Leon Goldman said: "A good way to make something secret is to publish it in the scientific, not medical, literature."[24] It is significant to note that this compound went unnoticed on the shelves of biologists and in the journals of allied biological science for 19 years before

it was recognized as an invaluable tool in the fight against fungous disease.

In an article in 1958 by J. C. Gentles[25] it was first demonstrated that Trichophyton infections in mammals could be controlled by the drug. It was also mentioned in that article that Trichophyton verrucosum infections in cattle were also successfully treated with griseofulvin.[26] Studies on toxicity of the compound indicated that it could be given safely to animals in oral therapeutic doses of 50 to 100 mg. per kg. without systemic toxicity. Williams, Marten and Sarkany[27] published the first reports of the treatment of humans infected with ringworm with this oral griseofulvin. Blank and Roth[28, 29, 30, 31] published the first reports in the United States of the therapeutic value of the compound against ringworm caused by Trichophyton, Microsporon and Epidermophyton.

The Response of Onychomycosis

In reference to nail infections treated with griseofulvin, Dr. V. Pardo-Costello said: "Cases of nail infections are more recalcitrant to treatment, because of the length of time of growth of the nails. It requires anywhere from four to six months to clear a case of fungous infection of the nails." [32]

Kligman described the evolution of the fungous infection in relation to the normal dynamics of nail growth. Interpretation of the changes in onychomycosis requires an appreciation of the normal structure of the nail organ and its patterns of response to injuries. Although destruction of the nail plate is the conspicuous feature, the invasion of the nail bed is the essential pathologic event.[33]

Kaminsky presented comparative observations on a total number of 262 patients treated with griseofulvin administered by mouth. The results obtained in 67 patients with Trichophyton infections of the nails, 11 patients with psoriasis unguium, and 2 patients with an association of both diseases indicated a cure of the mycotic nails in a relatively uniform period. It was gathered that griseofulvin constitutes a unique method of treatment of onychomycosis. Oral treatment with griseofulvin also brought about clinical changes in 5 out of a total of 11 cases of psoriasis with nail involvement.[34]

Wilson said: "I am not certain as yet whether persons who have infected toenails should be treated with this drug continuously during the time the toenail requires to grow completely to normal. That would take some six months on the average. I think it may be advantageous to treat such a patient for two to four weeks, then wait one or two months, and then re-treat on a couple of succeeding occasions in order to prevent reinfection when the last vestige of the involved fungous portions of the tips are being shed." [35] "I don't think nails should be removed—I was against it before we had griseofulvin and I'm against it now that we have griseofulvin. I have seen such a small percentage of cures obtained by complete removal of fingernails and toenails that I have become very discouraged with this procedure. I believe that it is better to allow the material to stay there. I think we should realize that griseofulvin contributes a resistance to fungous invasion in a certain layer of cells. This layer of cells produces nails, it produces hair, it produces skin. As this layer of cells moves outward, to be finally shed from the periphery, it becomes a sort of a barrier through which the fungus cannot pass. The surgical removal of nails would remove the barrier as well as some peripheral infected nail. I also believe it is unwise to use keratolytic agents on the skin during the administration of griseofulvin. It is true that such agents might remove the most external portion of the keratin, and thereby remove some of the organisms, but they would also be likely to remove the part of the keratin that is endowed with this drug and is serving as a resistance barrier to the deeper penetration of the infection. I think it is best to let these things take their natural course." [36]

Robinson stated: "In toenail infections we have observed the greatest resistance to treatment with griseofulvin. Our confreres

in England are now removing the infected toenail and under a mantle of griseofulvin are continuing systemic treatment with apparently good results." [37]

Livingood said: "Newcomer of Los Angeles has reported favorably on a series of patients with onychomycosis who have been treated by avulsion of the involved nails followed by the administration of griseofulvin until the nails regrow. Fosnaugh, one of my colleagues at the Henry Ford Hospital, has had a similar experience with this regimen of treatment and, also, he has noted that avulsion of the nail results in an increased rate of growth which decreases the duration of therapy with griseofulvin. It seems to me that this is a promising approach to the treatment of selected patients with severe fungous infections of the nails."[38]

Desai states: "I think that another important factor in judging the efficacy of griseofulvin therapy is the growth rate of different epidermal structures, the speed, that is, with which these structures are going to be cast off. I think it is important to realize that different nails in the same person may be growing at different rates, as we have demonstrated in several cases. It is logical to presume that the results are much superior if you remove the infected nails, because you cancel the importance of the growth rate period, which can vary anywhere from three to six months. In other words, if you remove toenails you probably will succeed with shorter treatment periods." [39]

Lamb stated: "I think we must keep on with local treatment on the nails. I prefer an electric dental bur, and bur the nails back regularly every week. That is what I did to my own and to other toenails and fingernails." [40]

Wilson further said: "The ideal antifungal treatment would be one which could be administered internally, exerting its influence therefore from within outward—unlike most of our previous materials, which are put on topically and exert their effect from the outside inward." He added: "Griseofulvin is the only antifungal antibiotic which has appeared so far which is apparently reasonably safe for internal administration." [41]

Wilson warned against the waste of this antifungal agent by its misuse. He advised: "Penicillin is only about 40 per cent as valuable to the medical profession as it was at its beginning, because our bacterial enemies have learned to resist it. Sooner or later, our fungal enemies may learn similarly to resist griseofulvin. If it is used too widely and without appropriate controls, we may lose some of its value." [42]

Resistance of Fungi to Griseofulvin

In a study of the resistance of fungi to griseofulvin in vitro, Robinson grew 7 dermatophytes on solid Sabouraud media. Each showed some tendency to develop resistance in vitro. Growth difference of the seven dermatophytes in identical concentrations of griseofulvin indicate that clinical response to systemic griseofulvin therapy has little or no relation to the in vitro resistance of the organism. The data in this preliminary report suggest that in vivo resistance to griseofulvin may develop.[43]

Rosenthal observed that Trichophyton rubrum and Microsporum canis, when cultured for prolonged periods of time on media containing griseofulvin, developed the ability to grow on higher concentrations than the parent strain.[44]

Schwarz and Loutzenhiser studied the curling factor of griseofulvin utilizing a simple technique in which griseofulvin powder was placed on culture medium supporting a developing colony of griseofulvin-sensitive fungus. Microscopically, the curling could be observed within a few hours in those hyphae nearest to the site of griseofulvin application. This change could be seen in the remaining hyphae over a period of several days as the antibiotic dispersed throughout the culture medium. The curling of the hyphae was initially clearly demonstrable; after a period of time the fungus appeared to recover and was able to grow in the form of a fine colony, even

over the site of the application of griseofulvin. The fungus studied in this fashion showed no alteration in sensitivity to griseofulvin.[45]

The Dosage Schedule of Griseofulvin

The work of Andrews and Domonkos shows that griseofulvin exerts no action on the inflammation but acts directly on the hyphae of the fungi, particularly on the growing tips of the hyphae. Griseofulvin is fungistatic and is also fungicidal. Andrews said: "It is apparent that certain acute attacks of dermatophytosis may be cleared by conventional local therapy faster than by griseofulvin given orally. However, the carriers of trichophyton infections of the skin of the feet and hands, with or without nail involvement, may be benefited very much by griseofulvin orally. Of course, most of the recurrent cases occur in carriers. The fungus in these cases is usually located deep in the keratin of the horny layer where it cannot be reached by any drug except griseofulvin, which is keratotropic. The recommended dose for adults for this purpose would be 1,000 mg. daily in four divided doses of 250 mg. each, for a period of at least four months. After such prolonged treatment positive cultures may still be obtained at times. So it is premature to decide how long treatment should be continued, and how effective such treatment is, in chronic recurrent cases of dermatophytosis of the hands and feet. Griseofulvin may completely cure the carrier, so that the disease does not recur." [46]

Livingood states: "It is essential to make a definite distinction between chronic infections of the palms and fingernails and chronic infections of the feet and toenails . . . our experience has been that most of our patients with chronic infections of the palms and fingernails are well satisfied with their therapeutic results on a dosage schedule of one gram a day for periods of five to seven months. The vast majority of our patients with toenail involvement and chronic infections of the interdigital spaces of the feet and/or soles have had varying degrees of improvement but, essentially, griseofulvin alone has only a limited role in the treatment of patients with such infections. Reports by Prazak and others seem to indicate that concomitant local treatment with appropriate topical medicaments and administration of griseofulvin is a more promising approach for these patients with chronic tinea pedis. Also, although I agree with what has been said about the possibility of reinfection, I still think that there is at least a good possibility that many of these people who have had clearing of chronic infections of the palms and fingernails will not necessarily have a recurrance in the immediate future, and will remain satisfied with their results for at least some time to come." [47]

Desai shows the following:

"Clinical Results (T. rubrum infection). It was intended to correlate the mycological events occurring on the skin with administration of griseofulvin. The dosage schedules, period of administration, clinical results, and results of direct examinations of scrapings from healed lesions are tabulated below:

Dosage	Number of cases	Duration of treatment	Number of cases with some resistant lesions	Spores
5 mg./lb. per day & alternate day	11	3-6 wks.	3	11 positive
7 mg./lb. per day.	11	2-3 wks.	8	7 positive
10 mg./lb. per day	7	4 wks.	nil	10 positive

Active resistant, few isolated follicular nodules, and recurrences were noted with the lower dosage schedules. Resistant nail infection was seen in one case where some of the nails failed to regrow (90th day).

"Mycological Results (T. rubrum infection). Direct Examination: Hyphae break between 3rd and 8th day at septa. Abnormal, distorted, broken hyphae and many spores were seen to persist in some cases even up to 90 days. Spores persisted at all

dosage schedules in varying quantities. Many spores showed yeast-like budding forms (up to 90 days). Cultures: In occasional cases, maximum period at which positive cultures could be obtained were 32nd and 47th day of therapy with 5 mg. schedule, and up to 14th day with 10 mg. schedule. Culture recoveries were uneven. The nutritional requirements and pathogenicity of the organisms were not affected. Growth time was delayed. . . . Direct examination of scrapings (KOH mounts) is a better guide to control of treatment than cultures."[48]

Nelson said: "For the treatment of infections of the hands, feet and nails—and those we have encountered are virtually all Trichophyton rubrum infections—we have used dosages of 1, 1.5 and 2 Gm. of griseofulvin per day. Despite the fact that these relatively large daily doses have now been continued without letup for periods of 6 to 11 months, we have not seen consistently good results in our series. Clinical improvement of the skin of the hands and feet has, of course, been noted; but in the majority of our patients, and I emphasize majority, cultures of the skin and nails have continued to yield viable fungi, and the nails have shown virtually no clinical improvement. On the basis of our results thus far, while I am not prepared to say that griseofulvin is a failure in the treatment of long-standing fungal infection of the toenails and fingernails, I will say that it does not seem to be a panacea in our hands. A dosage of a half-gram of griseofulvin per day, even if it is maintained for many months, seems to us to be quite inadequate. In many cases in our experience, even as much as 2 Gm. a day will be ineffective in eliminating the fungus and producing clinically healthy nails." [49]

Toxicity of Griseofulvin

Flood said he had given oral griseofulvin deliberately to patients with repeated histories of penicillin reactions without any reactions at all.[50]

Livingood said that at the present time he believed that all patients who are taking griseofulvin should have repeated blood counts at intervals of 2 to 3 weeks.[51]

Livingood further stated: "The side patients include nausea, abdominal discomfort, diarrhea and headache which has been the most prominent symptom in our series of cases. Other investigators have reported the occasional occurrence of various types of cutaneous eruptions, especially urticaria and toxic erythema, but thus far it appears that there is no cross-sensitivity effects which we have seen in a few of our between griseofulvin and penicillin. We should be aware of the fact that drug fever, sore throat—not explained on the basis of bacteria—and apparent mental disturbance characterized by slowing of the reaction time have been observed.

"When a new drug is introduced, one is always concerned about the possibility of hematopoietic reactions. Complete blood counts and bone marrow examinations have been done before and after prolonged therapy with griseofulvin by a number of investigators. We have been able to follow a group of 64 patients in this manner and thus far we have not noted any really significant change either in the bone marrow or in the peripheral blood; our studies included bone marrow examinations in 16 patients, leukocyte count, hemoglobin determination, differential count, estimation of the number of platelets and study of white cell and red cell morphology in all of the 64 patients. Indeed, to my knowledge, no serious hematopoietic reaction has been reported, although both Pipkin and McCuistion have seen a few patients who had transient leukopenia and a shift to the right of the leukocyte count following administration of griseofulvin.

"A number of observers, including our own group, have seen varying degrees of albuminuria following the administration of griseofulvin. This has occurred in only a small number of patients and appears to be reversible. Further studies along these lines are in progress. In the meantime it seems essential that urinalysis should be

done before institution of treatment with griseofulvin and at intervals during the course of therapy. It is pertinent to add that kidney function tests in 32 of our patients were within normal limits before and after treatment with griseofulvin for prolonged periods.

"We have done a battery of liver function tests before and after griseofulvin therapy in 36 of our patients and have noted no abnormalities. As far as I know, no evidence of liver damage due to griseofulvin has been reported.

"It is essential that the physician familiarize himself with both the definite and the questionable side effects which have been observed to date. These include a variety of symptoms, such as headache, gastrointestinal disturbances, cutaneous eruptions and albuminuria. Although there is a variation in experience, the fact that transient leukopenia has been seen by several observers must be noted. I wish to emphasize that these apparent reactions to treatment have been observed in only a small percentage of cases.

"In summary, a survey of the experience to date justifies the conclusion that griseofulvin is a relatively safe drug for the treatment of superficial fungous infections, even when prolonged treatment is necessary. However, it must be emphasized that we are dealing with a new drug which has been in general use for less than six months and for this reason, as well as the fact that potentially serious reactions have been seen in a few patients, griseofulvin should be administered only under the supervision of a physician who sees the patient at periodic intervals during the course of treatment. A complete blood count and a urinalysis should be done before treatment and repeated at intervals as long as the patient is taking the drug. In following these patients on griseofulvin therapy, one must keep in mind the fact that often symptoms such as headache and gastrointestinal disturbances are difficult to interpret, and also minor variations in the leukocyte count may not be significant. It is not practical to enumerate all of the circumstances which make it desirable to discontinue griseofulvin, but obviously the drug should not be continued if there is leukopenia or any evidence of a possible hematopoietic reaction or abnormal findings in the urine, or a cutaneous eruption which seems to be related to administration of the drug, or potentially serious symptoms." [52]

Wilson admonished, "We can expect some reactions with griseofulvin because we must expect toxicity with any drug." [53]

Sternberg, et al. wrote: "No serious side reactions to griseofulvin therapy were encountered (in 92 patients). The most frequently observed reactions were transitory macular erythematous, urticarial and vesicular eruptions. Other transient symptoms included nausea, mild diarrhea, headache, and dryness of the mouth and thirst." The dosage of griseofulvin on these 92 patients was one gram per day orally for all weighing more than 60 lbs.[54]

The effect of griseofulvin on semen quality and spermatogenesis in the human at daily intake level of 2 gm. was measured by MacLeod in 22 normal individuals over a period of approximately six months. Two control semen examinations were made and testicular biopsies obtained prior to the beginning of treatment. Semen examinations were made at weekly intervals after the onset of treatment. The semen evaluation comprised estimates of sperm counts and motile activity and the examination of sperm morphology. Testicular biopsies were obtained from 8 men after three months of treatment. The study is continuing, but since semen quality is an excellent criterion of spermatogenesis, the results obtained to date on semen quality may be taken as a reflection of changes in the testes. To date, no effects on spermatogenesis or upon semen quality, apart from the spontaneous fluctuations usually seen in the latter, have been detected.[55]

MacLeod stated: "My interest in this was stimulated first of all by the various pharmaceutical companies who first brought this matter to my attention. My interest was

stimulated further by the reports of Paget and Walpole that rather overwhelming doses of griseofulvin administered intraperitoneally in rats produced necrosis of the testes. In my field we are always looking for a substance which will produce reversible inhibition of spermatogenesis, and we felt that this might possibly be such a substance. We were fortunate in having two populations already set up in two penitentiaries. These men in the two groups were taking this drug at a rather high level daily and we were able to get control testicular biopsies from them and also study semen quality throughout. The study lasted for a period of three months in the first group and for a period of six months in the second group at dosages of 2 Gm. daily of griseofulvin.

"I can summarize the results rather briefly by saying that we have seen no effects whatsoever on spermatogenesis. We have used semen quality primarily as an indication of what is happening in the testes, and semen quality can be a very sensitive indicator indeed. We have placed special emphasis on sperm counts, sperm motility and the morphology of the spermatozoa. I have placed the most emphasis, really, on the morphology of the spermatozoa, because if there is any disturbance whatsoever in the germinal epithelium this will be seen very quickly indeed in the characteristics of the spermatozoa as they appear in the ejaculate. I spent the most time on the six-months' group because the three-months' group showed absolutely nothing. I should add that the six-months' group showed nothing at all either. We took weekly semen specimens from these men throughout the entire experimental period and I was amazed, frankly, at the stability of the semen quality throughout the study. Indeed, this has given us very valuable information about a normal population of humans. Testicular biopsies at the end of six-months' treatment were normal.

"The earlier results of Paget and Walpole were produced, first of all, in another species and were produced by rather overwhelming doses of the substance. I have little doubt that were we to introduce a comparable amount of griseofulvin into the human, if we cared to risk it, we might possibly get some effects. However, at the 2 Gm. daily dose level, I doubt very much indeed that we shall ever see effects on human spermatogenesis. I am not prepared to say, at the moment, what the effects might be on the prepuberal germinal epithelium. That is going to be a very difficult thing to determine. No studies, so far as I know, have yet been done. I refer particularly to the use of griseofulvin in the young child, in tinea capitis, and so on. However, my feeling at the moment is that there will probably be no effect whatsoever on the prepuberal testis."[56]

The following studies were done by McCuistion, Lawlis and Gonzales on 28 patients receiving 1 gm. of griseofulvin daily:

1. Complete blood count (weekly).
2. Routine urine examination (weekly).
3. Bone marrow examination (before & after 1 mo. treatment).
4. Blood urea nitrogen (before & after 1 mo. treatment).
5. Creatinine (before & after 1 mo. treatment).
6. Uric acid (before & after 1 mo. treatment).
7. Caphalin flocculation (before & after 1 mo. treatment).
8. Thymol turbidity (before & after 1 mo. treatment).
9. Testicular biopsy (2 cases) (before & after 1 mo. treatment).
10. Electrocardiogram (before & after 1 mo. treatment).
11. Electroencephalogram (before & after 1 mo. treatment).
12. Psychological (before & after 1 mo. treatment).

No toxic effect of the drug was noted except for mild to moderate depression of the segmented cells in the peripheral blood. This effect was not noted in the bone marrow studies. While the total white blood counts showed no significant change during therapy, such counts done six weeks

after cessation of medication showed a seeming "rebound" phenomenon.

Patch tests were performed on 200 individuals, including 28 who had previously received griseofulvin internally. A 5 per cent mixture of griseofulvin in a water soluble base produced mild (1 plus and 2 plus) reactions in 6 (3 per cent) and more severe (3 plus and 4 plus) reactions in 3 (1.5 per cent). None of the patients who had received griseofulvin internally showed any positive reaction.[57]

Two patients who had developed severe urticaria previously on penicillin therapy had no allergic or sensitivity reactions from griseofulvin.[58]

Laboratory examinations in 32 patients on griseofulvin were performed initially, at the second and fourth weeks, and thereafter at four-week intervals. They demonstrated no renal changes, no liver function changes.[59] In another study these laboratory data were consistently unchanged by the antibiotic.[60]

Levels of griseofulvin in serum can be determined either by biological assay or by using radioisotopic technics. In the latter case, tritium-labeled griseofulvin is employed.[61]

Slight headache, relievable with aspirin, and mild diarrhea or G.I. uneasiness are probably the most frequently mentioned side effects with griseofulvin. Both symptoms usually disappear after a week or two of continued treatment. Other side effects infrequently reported were vertigo on taking the drug in a lasting state and fatigue. Fullness of the head with insomnia and exhilaration occurred in one patient. In only 2 cases among all reported at the Seventh Annual Symposium on Antibiotics were side effects severe enough to stop treatment.[62, 63, 64, 65]

Goldman said: "We have seen occasional and peculiar reactions in tinea pedis under oral griseofulvin therapy. The cultures—T. mentagrophytes, for example—become negative and yet the patient on griseofulvin will get a vesicular response. We have seen so-called "id" eruptions develop on the hands in patients under griseofulvin therapy. What that means in terms of immunologic relationship we do not know. If we use topical therapy and if some of the topical vehicles are strong, we may of course get vesicular responses as a direct reaction. We have had some contact dermatitis in patients with negative patch tests to griseofulvin per se. So if an individual gets an acute vesicular response in the feet it does not necessarily mean that it is part of the fungous infection. It can be due to sweating difficulties, contact dermatitis, or any of those various factors which make what we call, or what we try to call, tinea pedis a much more difficult and complex condition than it seems to be."[66]

Recurrences and Reinfections

Failures with griseofulvin are most likely due to misdiagnosis and the use of this very specific agent in non-fungal diseases. To prevent this, it should not be administered until the causative fungus is identified from scrapings or cultures. Not all ring-like lesions are ringworm—and not all ringworm infections exhibit ring-like lesions.[67]

Pardo-Costello said: "I believe there is a definite local action of griseofulvin on the condition when applied in ointment form or as an alcohol solution of 2% amyl acetate. That would perhaps be a way to prevent what we are beginning to see now; that is, reinfection in some cases that were cured three or four months ago and now show new lesions. Probably these are not relapses, but reinfections from the surrounding media."[68]

Goldfarb and Sulzberger stated that the clinical cures they obtained were at times associated with persistently positive mycologic laboratory findings. They called these patients as being in a "healthy carrier state."[69]

Dr. Wilson stated: "I wish to emphasize here that I have not seen any reason as yet to change my belief that people who are infected with Trichophyton rubrum are infected because they are immunologically defective in some way. The administration of griseofulvin in no way changes this funda-

mentally defective immunologic system. Therefore, they are prone to become reinfected. In fact, at the present moment I am inclined to believe that the fungi stay in the immediate vicinity and perhaps uniformly on the patient's skin. We are able to culture Trichophyton rubrum from the fourth toe webs of persons who are clinically cleared of this infection, indicating that the fungus is only awaiting the omission of the drug to proceed once more to cause disease in these patients. Even if this were not true, it is very discouraging to think of the number of spores that have been cast about in the environment of these people during the preceding weeks or months. I find it hard to see how they can keep from becoming reinfected by these spores even if they are completely cleared of the disorder."[70] Wilson also said: "I don't know the percentage of persons who are susceptible to this T. rubrum inherently, but I have estimated it in my own mind as not more than approximately 1 in 50 in the general population. Even after these susceptibles are controlled well with griseofulvin—and I do believe that they can be controlled by this medication—they will have to be maintained on small doses of the drug at intervals during their lifetime to prevent them from becoming reinfected from their own environment. I think it is impossible to conceive of patients being able to sterilize the entire environment in which they live —their homes are a veritable sea of spores of this organism; their offices, their automobiles, their contacts. They leave a trail of this organism from the scales which are shed from their skin. I think they may become reinfected very easily."[71] He further stated: "I have gone on record in the past as saying that perhaps we must treat these individuals with griseofulvin in the same manner that we use insulin for diabetes. I do not know where this next idea originated, but I believe it should be noted here. It is possible that once we clear a patient completely of this infection we may then be able to prevent the fungus from again extending quite as deeply under the nails or into the hair follicles as it did previously. Maybe we can keep it from ever again penetrating so deeply that topical medication cannot control it." [72]

Desai said: "There is enough evidence from clinical studies at the moment that T. rubrum infection is rare in childhood, and is much more common at adolescence and after. During this period of human growth we find that there is a transformation in the nature of keratin. The skin of the child is smooth and velvety. From adolescence on, the skin becomes coarser and has much more keratinization. Secondly, we found also that there is a self-termination of experimental infections in some people and not in others. That again signified to us that healthy keratin has an inherent property to terminate the fungous infection; but it will remain chronic in those patients in whom keratin is possibly defective. The third factor was a histopathological finding. We found that invasion of the zone of new keratin formation has to occur before one can get the symptoms; in other words, in most of the histopathological studies from T. rubrum-infected skin as well as a few cases of T. tonsurans and Epidermophyton floccosum infections, we found invasion of the deeper zones of keratin, just above the 'barrier' zone of epidermis, occurring in every case. And later on we found that in many cases where the disease had clinically healed satisfactorily we could still demonstrate active hyphae and spores on the apparently healed areas. This confirms what I was saying about the disease symptoms being produced only if there is a deeper invasion by the fungus of the keratinizing zones. And, incidentally, we found active hyphae and spores in the clinically healed areas in many cases, even after a period of 60 days following termination of treatment. I think this is a very important point.

"Another important finding was from our family contact studies. We found that we must investigate this infection epidemiologically as well as clinically. In dealing with the family contacts of a patient, we

found that more than 60 per cent of the members of his family also had small or minor lesions due to T. rubrum. This signifies that this fungous disease has a pathogenicity and an infectivity for the whole family by contact transmission. If you treat only one patient from a family, then naturally you must expect relapses and recurrences."[73]

Improvement of Symptoms

Signs of clinical and laboratory improvement with griseofulvin tend to follow a pattern. In order of their usual appearance they are: (1) Relief from pruritus, (2) Decrease of scaling, (3) Disappearance of anhidrosis, (4) New growth of healthy nails, (5) Negative potassium hydroxide examinations, and (6) Negative cultures.[74]

The length of time required for the first signs of improvement and, later, for cures with griseofulvin depend mainly on the site of infection. In the majority of patients, glabrous skin infections have been found to show improvement in one week with cure in three weeks. At the other end of the time scale are fungous infections of the nails which may not visibly improve for four to seven weeks and may not completely clear for 16 weeks in the case of fingernails, or for a considerably longer time in the case of toenails. In between, in order of time needed for the same results, there come crural areas, palms, soles, scalp and scalp hair, and glabrous skin with follicular involvement.[75]

The gradual increase of the clear zone of a healthy nail is the unmistakable sign of improvement in onychomycosis treated with griseofulvin. By marking the advancing edge of the healthy part with a file mark and measuring the distance from there to the tip of the finger, the time required for replacement of diseased nail and complete cure can be computed. Rate of growth is usually one millimeter per week for a fingernail and half of that for a toenail.[76]

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(References continued on page 141)

Some Experiments Involving Modifications of Fungus Culture Media*

Nancy Lu Conrad, D.S.C.

THE obvious necessity of being able to grow any microscopic organism at the will and discretion of an investigator brings about necessarily the constant improvement of culture medias. Much has been learned concerning growth habits and idiosyncrasies of fungi but much more specific knowledge is needed if they are to be controlled on media as well as with the clinical patient.

Since the growth rate and capabilities of fungi are somewhat inconstant depending on the type of media and species of fungus involved, it is expedient to say that variation of the media upon which they are planted must be used if one wishes to achieve demonstrable results as well as satisfying ones.

Contrary to the opinion of some practitioners fungi are not as easily cultivated as bacteria and even under optimum conditions their growth is slow and disappointing. Their growth characteristics are also erratic as compared to bacteria and although there is some standardization of medias there is no assurance there will be produced the desired result every time.

Since time is always of the essence in the treatment of a clinical entity, modern laboratory diagnosis involving fungi often fall short in assisting the practitioner, not because of improper technics but because fungus media have not been evolved to

* Paper submitted in the William J. Stickel Annual Awards for Research in Podiatry-Chiropody for 1960 and read at the 1960 Annual Meeting.

accommodate the erratic behavior of the organisms.

The following experiments were carried out with the idea in mind of improving basic accepted media for initial growth and identification of commonly found fungi encountered in daily practice, and not particularly the differentiation of specific types, although this subject is touched upon.

In the experiments conducted, the basic media used was similar to stock Sabourauds with the variations created to the extent desired. The idea in mind was to use additives for the purpose of possibly finding some which would create a more luxuriant growth at a possibly faster rate without changing the characteristics of the fungi which are considered standard and which enable them to be catalogued into their respective genus and species.

The three fungi chosen for inclusion were Candida albicans, Trichophyton mentagrophytes, and Trichophyton rubrum, the reason for these being that they are among the common ones found in practice and, since the media being tested is designed for expediting routine cultivation, they are the organisms in which there would be most concern. If the media under test produces no difference in accepted growth characteristics of these three it is still of course not safe to assume that there would or would not be a change in others but at least there would be some basis for expecting work with other similar organisms to parallel these results.

It is known of course that cultures of the gypseum group of the Trichophytons appear buff[1] to a darker tan in color and are fluffy and velvety with the reverse being a darker brown. The cultures vary sometimes to white while in the rubrum group there is a distinct reddish and purple coloring evident on the reverse.

It would be well to remember also that the results of the growth of these two fungi on corn meal agar is a chief means of separating them, namely that rubrum is always reddish and gypseum is yellowish. Candida appears on routine culture as creamy, stringy, glistening to dull-appearing colonies and are comparatively easier to cultivate. In fact these colonies can obliterate more sparsely growing ones.

It is also generally known that many fungi prefer neutral or alkaline media but now that additives can be used to control bacterial growth it is no longer as necessary to use slightly acid media for this purpose.

Culturing was done exclusively in screw cap tubes of about 4½ inches in length and ¾ inch in diameter. Agar butts were about ½ inch long. All tubes were incubated at room temperature.

The reader will recall that basic Sabourauds media is usually composed of peptone, dextrose (or another sugar as the case may be) and agar. Depending on the commercial firm this formula may be varied including the peptone concentration; however, this basic variation has no effect on the experiments since additives constitute the basis for result comparison. The additives used for this series of experiments were potato broth, carrot broth, corn meal, vitamin B complex, malachite green and various combinations of them. Control tubes were used at all times and growth examined at regular intervals.

In the first phase potato broth was used as the main additive. This was prepared by boiling for 20 minutes one medium-size potato in one quart of water. To a group of tubes 1 cc. of this potato broth was added and to another set 2 ccs. were added. Control tubes were set up. At the same time pour plates were made and inoculated, one set containing 1 cc. of the broth and one set containing 2 ccs. The tubes were inoculated by ordinary inoculating needle with a slightly curved end and the plates with a moist swab.

In 16 hours evidence of Candida growth was noticed, in 24 hours Candida albicans was pronounced and in 48 hours growth was quite thick. In 3 days slight evidence of growth of T. mentagrophytes was noticed and in 5 days growth was satisfactory for identification. T. rubrum was first evident in 6 days and luxuriant in 10 days.

There was approximately 6 ccs. of media in each tube and 12 ccs. in each pour plate. Added to this were 25-30 units of penicillin per cc. of liquid medium. This concentration of antibiotic seemed to keep the contaminant content down very well as there was no occasion to discard any tube due to this.

The composition of this medium was as follows:

Peptone	15 gms.
Dextrose	40 gms.
Agar	15 gms.

Additives:

penicillin 20-30 units per cc.
potato broth 1-2 ccs. per tube.

The second additive was carrot broth which was produced by boiling one medium-sized carrot cut into small pieces in one pint of water for 20 minutes. Then the agar was melted and cooled and at about 56 degrees C., 1 cc. of the broth was added to each of five tubes and to another set of five, 2 ccs. were added. Five tubes of each were used mainly for comparison of results. The tubes were inoculated with the three cultures (a total of 10 tubes for each culture) and were all incubated at room temperature. Controls were used. At the same time pour plates containing comparable amounts of carrot broth were made, inoculated and incubated.

In 18 hours Candida growth was evident and was fully grown in 48 hours. T. mentagrophytes and T. rubrum took slightly longer in this case and did not appear really luxuriant for about 7 days. There seemed to be more of a lag in growth as compared to potato broth agar. It might be said that in order to simulate identical conditions all tubes were prepared, inoculated, and incubated on the same schedule.

In the next phase a combination of the two additives, potato broth and carrot broth, was used and observed. Here two combinations were used. In 10 tubes 1 cc. of each of potato broth and carrot broth was added to the basic ingredients as well as to pour plates and in still another set 2 ccs. of each were added to each tube and pour plate. This amount of material worked quite well in the plates but of course the tubes were overly full of material and by necessity had larger than ordinary agar butts. Antibiotic (penicillin) was increased to 30 units per cc. of material. In a scant 12 hours some evidence of growth was noticed and in 24 hours good growth appeared in the Candida tubes. In 3 days T. mentagrophytes growth was evident and in 4 days T. rubrum commenced to appear. Candida growth was extremely luxuriant and that of the slower growing fungi was satisfactory. In this phase three tubes of Candida cultures were discarded due to the appearance of Staphylococcus aureus. It was quite noticeable that growth in this phase of the work in which both potato and carrot broths were used was faster and heavier than with either one additive used individually.

One other idea was injected into the tests performed, namely, the use of Vitamin B complex as another additive which proved to be extremely worthwhile. Approximately 30 cumulative mg. were used and added to each tube of media containing the basic ingredients as well as both the potato and carrot broths. No attempt was made to use just the B complex alone with the basic ingredients. Without a doubt this constituent proved to be valuable and should be remembered for future reference if rapid luxuriant growth is desired. Candida colonies appeared very glistening here and T. mentagrophytes were extraordinarily white and powdery. T. rubrum growth was very satisfactory but as far as appearance was concerned there was no demonstrable difference.

One other additive was used in the series of experiments, that of malachite green with the idea of creating some possible color change during the growing phase. Although growth was noticed in the Candida tubes in 24 hours the colonies were dwarfed and not at all luxuriant. In about a week the colonies were diminishing. There appeared to be slight liquefaction of the media at the base of the slant and the green color began

TABLE I

	Candida albicans		Trichophyton mentagrophytes		Trichophyton rubrum	
	First growth	Acceptable growth	First growth	Acceptable growth	First growth	Acceptable growth
Potato broth	16 hours	24 hours	3 days	5 days	6 days	10 days
Carrot broth	18 hours	48 hours	7 days	10 days	7 days	10 days
Potato and Carrot	12 hours	24 hours	3 days	9 days	4 days	9 days
Potato, Carrot, Vitamin B	12 hours	24 hours	3 days	9 days	4 days	9 days
Malachite green	24 hours	———	8 days	———	8 days	———

to fade slowly. Growth in the T. mentagrophytes and T. rubrum tubes was all extremely slow in coming and not at all satisfactory. There was no color change that might point to a possible criterion of identification.

As a side issue, commercial corn meal agar was tried and was used as it is prepared by a commercial supplier.[2] It was melted, cooled and had added to each tube ½ cc. of potato broth. A series of tubes were inoculated with each of the three test cultures. No plates were used for this particular medium. Candida flourished easily and was apparent in less than 12 hours. The other two cultures were evidenced in a scant 3 days. Since corn meal agar is especially good for Candida, the addition of potato broth enhanced growth considerably so that light inoculation is suggested when using known cultures of Candida albicans.

Something should be said of the mature, final stages of growth of the three cultures. On potato agar and combination of potato, carrot, and Vitamin B complex, Candida became extremely moist and glistening. In the tubes containing malachite green Candida was dull and the colonies were small. They seemed to diminish as time went on. T. mentagrophytes and T. rubrum in the malachite green tubes were not nearly so luxuriant as with other additives as the dye seemed to be a hindrance to growth.

Colonies transplanted from the combination tubes to other combination tubes and to plain Sabourauds grew well but those transplants from the malachite green tubes were slow in establishing themselves and some did not grow at all.

With potato broth, of course, chlamydospore production is enhanced; however, since these tests were concerned with gross growth rather than microscopic analysis, cultures were not examined with this in mind.

Table I is a resumé of the growth characteristics obtained.

Summary

In this series of experiments several additives were used as adjuvants to basic fungus culture media with the idea in mind of producing more luxuriant growth at a more rapid rate of room temperature.

The additives were potato broth, carrot broth, Vitamin B complex and malachite green. The cultures used were Candida albicans, T. mentagrophytes, T. rubrum.

The following points were observed:

1. With potato broth and carrot broth a definite, but only slight, advantage was produced.
2. When the two broths were used in combination more pronounced results were obtained.
3. When the two broths were used together in combination with vitamin B complex the most advantageous results were obtained.
4. Malachite green as an additive proved to be no advantage and is not worthwhile as far as the growth or gross identification of fungi is concerned.

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References

1. Conant, Smith, Baker, Callaway, Martin: Manual of Clinical Mycology.
2. Difco Manual.

Clinically Speaking

A place for the more informal presentation of reminders, suggestions, notes, observations and technics of value in office practice. Your contributions of short manuscripts or illustrative case histories will determine this section's usefulness.

Granuloma Annulare— A Clinical Note

Daniel Hyman, M.D.*
Samuel Brezak, Pod.D.*

THE skin ailment designated as granuloma annulare is of interest to podiatry because of the differential diagnosis in those cases that have lower extremity lesions. Exact statistics as to incidence of this condition are not reliable since on the whole the condition does not cause sufficient distress to bring most patients in for treatment. Also the condition is often misdiagnosed and it is not rare for a patient with granuloma annulare to be treated for "ringworm" for many months before consultation determines the correct diagnosis. A clinical description of granuloma annulare is: The primary lesion of granuloma annulare is a skin-colored or erythematous papule, which may progress to a ringed appearance, a plaque or a nodule. Etiology—probably psychogenic, but to date this has not been fully established.

Granuloma annulare is found mostly in children but is not rare in adults. Spring and summer are the usual seasons for new lesions to start but one must keep in mind that since these lesions may persist for years, the condition may be seen all through the year. Not uncommonly, patients will attribute the findings to insect bites and it is a fact that some lesions and their exact sites can be predicted by some of the more intelligent patients because of a stinging sensation not unlike that produced by a bite at the site which will show a lesion within a week. However, biopsy of such a site at any early stage fails to reveal any evidence of insect bites and we believe that insects do not play a part in the etiology. We believe that psychogenic elements are involved in the causation. It has been known for many years that a small punch biopsy often results in a clearing of an entire lesion or that biopsy of one lesion may result in clearing of all other lesions of granuloma annulare that the patient had. In all our patients a tension-producing incident may be elicited in the history prior to onset of granuloma annulare. We also admit that one can find history of tension in almost any patient and that a given disorder is not therefore proven due to anxiety, worry, or tension because of such simple association.

Because of our belief in the psychogenic background, we wish to discuss treatment at this point. Any painful lesions on the sole should be excised, provided conservative nonsurgical methods have failed to elicit relief. Biopsy is urged in all cases, even if the diagnosis is obvious. Superficial psychological support is given and judicious use of atarax, phenobarb, or a sedative type of antihistamine such as phenergan is started. The biopsy report is shown to the patient or parent as further reassurance that no other condition is present. After the biopsy site is healed, the patient returns in one month. A surprisingly high percentage of cases will have been cleared by this time. For those that have not, a variety of "treatments" have been used in the past; these vary from superficial X-ray therapy to placebo X-ray therapy, to injection of almost any known substance. We are presently experimenting with intralesional triamcinalone but have not as yet evaluated the results over the other forms of therapy which, in our opinion, are placebo in nature. We advise that the therapy used on resistant cases be simple, safe, and not be given more often than once a month.

Differential diagnosis of granuloma annulare varies with the type of lesion pres-

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ent: Ringed lesions have to be distinguished from psoriasis, ringworm; Papular lesions from lichen planus, verruca plana juvenalis, intradermic nevi; Nodular lesions from rheumatic nodules, small cysts and ganglia; Plaque-like lesions from sarcoid and certain forms of T. rubrum infection. When syphilis was prevalent, late secondaries or early tertiaries could be a differential problem from the clinical point of view.

Summary

1. Granuloma annulare occurs frequently in the lower extremities, and should be carefully considered in the differential diagnosis of lower extremity skin lesions.

2. Biopsy is urged in all suspicious lesions.

3. Only methods of therapy that are non-scarring should be used.

4. Intralesional injections of Aristocort have cleared the first two cases in our current series.

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5704 18th Ave., Brooklyn, N. Y.

Granuloma Annulare— A Case Report

Seymour H. Silver, M.D., F.A.C.P.
Franklin S. Glickman, M.D.
Gustav Wanderer, Pod.D.

GRANULOMA Annulare is an uncommon disease which is seen occasionally by the podiatrist. He should be aware of the condition, since he may be the first to see it, and be able to differentiate it from other lesions.

A five-year-old female was first seen in September 1960, because of an asymptomatic lesion on the dorsum of the left foot of about 6 weeks duration. Examination revealed an annular, elevated flesh-colored plaque approximately 4 cm. in diameter, nodular about the periphery, and firm to the touch.

Comment

This condition was first described by Colcot Fox in 1895 under the title "Ringed Eruption."[3] The presently accepted name "granuloma annulare" was coined by Crocker in 1902. Crocker's description, which is a classic, is extremely accurate.[5]

"—nodules or papules of slow development which tend to form circles by aggregation or partial coalescence, leaving component nodules still visible. They tend to undergo slow involution, so that the circle is broken, and only a crescent is left, or a gyrate patch where two or more crescents join. The inner or involuted side of the ring slopes down gradually into the normal skin . . . the outer border is more abrupt, but crenate or distinctly nodular, and there may be a very narrow areola. . . ."[2]

The etiology of granuloma annulare is unknown. Several rather strange facts which may have a bearing on the etiology are known. Frequently if the patient is given Vitamin D the lesion becomes accentuated. Often if procaine is injected or a biopsy done the lesions completely involute and disappear.[4]

The disease occurs most frequently in children and young adults. It may occur anywhere on the body, but sites of predilection are the dorsum of the wrist, fingers, elbows, neck, feet, ankles, and buttocks. Widespread multiple lesions are occasionally seen.

From the histopathologic standpoint, the main changes are a focal degeneration in the dermis, with mucin deposition, fragmentation and destruction of elastic tissue, and a variable infiltrate, sometimes including foreign body giant cells. It must be differentiated, under the microscope, from the necrobiosis lipoidica diabeticorum, and subcutaneous nodules of rheumatic fever and rheumatoid arthritis.[1]

Treatment is at best expectant inasmuch as the lesions are harmless and eventually involute. This may occur in from several months to several years. As mentioned above procaine injection or biopsy may be followed by complete involution. CO_2 snow has also been used. The common point to all modalities that claim success, appears to be traumatization of the lesion. Recently the antimalarial drug, Chloroquine, taken orally, has been reported successful in treating this condition.[2] Further studies must be done before the validity of this method can be established.

(Continued on page 148)

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A. RUBIN, D.S.C., Editor

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President's Message

Needs of Our Educational Institutions

Last year I listened to a dedicated podiatrist deliver a dedicated treatise of sincerity, appealing to the members of the profession in an effort to awaken them to the necessity of supporting their Alma Mater through the national educational fund or through their individual alumni fund.

Permit me this opportunity to quote Dr. Ken Nielsen of Omaha, Nebraska: "The head of grain is as good as the roots that nourish it. Feed the roots and the harvest is bountiful. Starve it and you get chaff." He continued, "Unless we give our schools some serious consideration, we will wait forever for the haze, fog and the clouds to raise, and give us a clear dawn with a full sun."

Unless every practicing member of this profession of podiatry-chiropody rises to the occasion and takes cognizance of his obligation and immediately steps forward with a suitable and a worthwhile contribution (which is an investment in the profession), we will fail to qualify for assistance for our schools from outside agencies and foundations, which are simply waiting to see what we, as a profession, will do for ourselves and what we have done to assist in qualifying our institutions by hiring and maintaining more full-time educators at the head of the various departments within the schools.

The very roots of our profession are the schools. We have a moral obligation to keep the roots nourished. And again I quote Dr. Nielsen: "Professional recognition never has and never will, nor never can exceed its educational background. None of us can be so void of conscience and a sense of moral obligation as to say, 'this is no problem of mine.' The day we prove our acceptance by adequate education and research; that day we will see our acceptance and recognition. We cannot afford professional mediocrity."

TODAY is the day for you! Remit your annual "donation obligation" to your school's Alumni Fund or The Fund for the Advancement of Podiatry-Chiropody Education.

Special Commission Formed to Study Our Educational Program

On recommendation of the Council on Education, with the concurrence of the Board of Trustees, the 1960 House of Delegates of the American Podiatry Association allocated funds for a study of the present educational program offered to those preparing for the profession of podiatry (chiropody). This study is to be conducted by outside, highly qualified people of known reputation. As a consequence, a commission, known as the Special Commission on Status of Podiatry Education, convened its first meeting in Washington, D. C., on February 1, 1961.

The House of Delegates recognizes that the profession has a major obligation to insure that there shall be an adequate supply of well-trained professional people caring for the nation's foot-health problems. In accordance with this policy, the Special Commission will be expected to examine (from a broad point of view) the profession's educational program, inquire objectively into what and where our problems in this area really are and make some recommendations.

The Special Commission is being asked to review the present status of professional education as offered by the schools, student selection, and the relationship of the Association and its Council on Education to these activities. Included will be a visit to each of the schools by members of the Commission, and a final report identifying the problem areas and incorporating its recommendations.

On the occasion of the visits, opportunities will be provided members and State Societies to present information, ideas, and questions for study.

Dr. William K. Selden, Executive Secretary, National Commission on Accrediting, has agreed to serve as Chairman of the Commission. Mr. Francis A. Kalbacher, who recently joined the APA staff as Assistant Director for Public Education and Information, will be Secretary. A complete list of the Commission members, titles and addresses is given below.

William K. Selden, LL.D., Executive Secretary, National Commission on Accrediting, 1785 Massachusetts Ave., N. W., Washington, D. C., Chairman

Lloyd E. Blauch, Ph.D., formerly U. S. Assistant Commissioner for Higher Education, 1785 Massachusetts Ave., N. W., Washington, D. C.

Leland Powers, M.D., Associate Director, Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois

George E. Guenzler, D.S.C., Chairman, Medical Liaison Committee, APA, 104 Professional Building, Freeport, Illinois

I. L. Baldwin, Ph.D., Special Assistant to the President, University of Wisconsin, Wisconsin Center Building, 702 Langdon Street, Madison 6, Wisconsin

F. A. Kalbacher, Assistant Director, APA, Secretary

P. R. Brachman, D.S.C., Secretary, Council on Education, APA, 25 E. Washington Street, Chicago 2, Illinois, and

A. Rubin, D.S.C., Secretary and Editor of the APA, will serve as ex-officio members.

This "outside" evaluation by the Commission should provide an opportunity to inform leaders in medical and higher educational circles, government agencies, foundations, philanthropies, and other public and private organizations of the role of the Podiatry profession toward present and future generations and of the needs of podiatric institutions in order to fulfill this role.

College Support Exceeds $100,000

The reports from the Fund for the Advancement of Podiatry-Chiropody Education and from the Educational Foundations of the various colleges indicate that a total of $63,729.10 has been contributed during 1960. This represents nearly a 50 percent increase over the $43,032.98 reported for 1959 and a total of $106,762.08 for the 2 years.

Alumni Looking to Colleges

More and more alumni are becoming interested in their Alma Mater. By contributing regularly they are keeping faith with their college and they should see that the college and its "product" do justice to the public welfare and our profession.

This has been a prime objective of the FUND and current reports indicate that an increasing number of concerned alumni are sending their contributions directly to the college from which they graduated. Many who pledged contributions through the FUND office are fulfilling pledges by contributing directly to their college.

Of important interest is the information received from state and regional meetings that many speakers are now requesting that their lecture fees be contributed directly to the FUND. Dr. Charles Turchin, Washington, D. C.; Dr. Ralph Owens, Oklahoma City, Oklahoma; and Dr. Edward Meldman, Milwaukee, Wisconsin, are members whose continued contributions in this manner have been made to the FUND.

Annual Giving

Continuing regular support of the colleges find the names of many, many people, companies and corporations again included on the lists accompanying this article. Special mention is made of the support extended by the Miller Shoe Company, which again this year has contributed $1,000.00 to each of our colleges—a total of $15,000.00 over the past 3 years.

The Women's Auxiliary of the APA has the FUND as one of its major programs and this year has added a contribution of an additional $500.00 to the original annual pledge of $100.00.

Activities of the FUND

The Board of Trustees of the FUND held their second annual meeting during the 1960 APA convention in Chicago. Invited representatives of the colleges were in attendance to discuss their present and future programs of the FUND. Professional fund-raising programs were considered to augment those of the colleges.

The program for 1961 will be continued at the state and local level because of the reduced appropriation from the Association. The FUND office has furnished a program outline and materials to each state society to secure our objective of $100.00 from each member, plus the desire to have each member become vitally interested in the future of his college.

Grants from the FUND

In addition to the grants to colleges, the FUND is making $1,500.00 available to the Special Commission on Status of Podiatry Education (see the article on page 129 in this issue).

Fund-Raising Survey

A chain-letter campaign is under way to collect the additional unearmarked funds necessary to conduct a national professional fund-raising survey before August, 1961. This survey would precede any national fund-raising program. Contributions for this survey are being received by the General Fund—monies earmarked for a college will not be used for this survey unless a college specifically requests that this be done.

FUND Expenses

The small administrative costs and legal and accounting fees for 1960 totaled $282.45. This is another year in which *none* of the funds designated for a particular college were used for the operating expenses of the FUND.

1960-61 FUND Board of Trustees

The FUND Board of Trustees is composed of: Dr. Harry I. Horowitz, President, representative for APA Board of Trustees; Dr. Seward P. Nyman, Secretary-Treasurer; Dr. Robert Shor, President-Elect, American Podiatry Association; Dr. Max Pomerantz, Association of Chiropody-Podiatry Colleges; Dr. Philip Brachman, Council on Education, American Podiatry Association; Mrs. Cleotha Parham, Women's Auxiliary, American Podiatry Association; Dr. Milton Wolfson, American Podiatry Association; and Dr. Merton Root, American Podiatry Association.

Contributions reported by FUND

	Total Received in 1960	Total Received in 1959-60
General Fund	$1,243.50	$4,163.20
California Podiatry College	795.00	2,185.00
Chicago College of Chiropody	572.95	1,584.95
Illinois College of Chiropody	748.95	2,071.95
M. J. Lewi College of Podiatry	1,210.00	3,714.50
Ohio College of Chiropody	599.00	1,476.00
Philadelphia College of Chiropody	325.00	1,632.50
Podiatry Society of the State of New York	800.00	1,150.00
TOTAL	$6,294.40	$17,978.10

Grants to Colleges Approved to Date

California Podiatry College	$1,370.00
Chicago College of Chiropody	812.00
Illinois College of Chiropody	1,323.00

Reported by the Colleges

	1960 Total Received
California Podiatry College[1]	$17,800.00
Chicago College of Chiropody[2]	9,427.32
Illinois College of Chiropody	19,753.38
M. J. Lewi College of Podiatry[3]	6,858.00
Ohio College of Chiropody	3,596.00
Philadelphia College of Chiropody[4]	
TOTAL	$57,434.70

[1] Does not include monthly payments of at least $10.00 on 174 pledges which average $600.00.
[2] Total received ($9,427.32) is composed of $5,902.00 for the Hospital Fund and $3,524.82 received during the fiscal period 1959-1960 for the School.
[3] Charter Fund contributions during 1960.
[4] No funds solicited during 1960.

Totals Reported by the FUND and the Colleges in 1960, $63,729.10.

Pledges and Contributions to the Fund for Podiatry-Chiropody Education

The following have made a contribution or pledge to the Fund, or directly to a college or its Alumni Foundation. Code for letters following individual names shown below:

ICC—Illinois College of Chiropody
CaCC—California College of Chiropody
ChCC—Chicago College of Chiropody
OCC—Ohio College of Chiropody
TUSC—Temple University School of Chiropody
LCP—M. J. Lewi College of Podiatry
GF—General Fund
NYSoc—The Podiatry Society of the State of New York.

Armstrong, Robert H.	GF	Eden, Theodore B.	LCP	Kannally, Richard R.	OCC
Arnowitz, Abraham	LCP	Eschbacher, Paul R.	CaCC	Katz, Samuel	CaCC
Ash, Fletcher T.	GF	Fitzke, Bob	GF	Kingland, Herbert D.	CaCC
Atkinson, Harvey	OCC	Frank, Seymour C.	LCP	Kleiman, Morris A.	LCP
Balkin, Solomon W.	ChCC	Freigenberg, Seymour	LCP	Konecke, Sheldon P.	GF
Beers, Larry Max	GF	Gabriel, George R.	GF	Ladd, Saul	NYSoc
Berg, Samuel S.	LCP	Glick, Jacob	LCP	Levine, Max B.	LCP-NYSoc
Bershod, Morton N.	LCP	Goldstein, Murray B.	NYSoc	Luft, Sol	GF
Boyce, Mr. and Mrs. Harlan	GF	Gould, Frank	LCP	McCormick, C. R.	LCP
Brand, Jerome	LCP	Graham, Lt. Richard W.	GF	McGlamry, E. Dalton	TUSC
Branning, Bertha	GF	Green, John E.	NYSoc	Meinecke, Raynor R.	ChCC
Bronspiegel, Harry	GF	Greenberg, Frank	NYSoc	Meldman, Edward C.	GF
Brown, V. Leonard	TUSC	Grossman, Murray	LCP	Michigan Association Wayne Co. Div.	GF
Buchbinder, Arthur	OCC	Guy, Joseph	GF	Mogull, Peter	LCP
Burger, Louis	TUSC	Haas, Morris	ICC	Morris, Jonas C.	GF
Burns, Lawrence T.	CACC-GF	Haigh, George F.	OCC	Nott, Don, Jr.	ICC
Carman, Lowell	GF	Hall, Vern S.	ICC	Nyman, Seward P.	GF
Chan, David Y.	CaCC	Halton, Harry L.	GF	Ohio Association, Women's Auxiliary	GF
Civic Hospital, Inc.	GF	Hancock, James L.	ICC	O'Toole, James R.	ChCC
Clark, Leiland E.	CaCC	Helbig, George F.	ChCC	Owens, Ralph E.	GF
Cochran, Clifton R.	ICC	Hogan, Gerald D.	GF	Perendy, William	ICC
Dawson, Robert B.	ICC	Hymes, Leonard	TUSC	Pock, Arnold	ChCC
DeHart, William E.	ChCC	Illinois Society, Zone 3	ChCC-ICC	Rakow, Martin A.	LCP
DeHart, William W.	ChCC	Isenberg, Maurice C.	LCP	Rasmussen, David C.	GF
Drew, Fred F.	CaCC	Kalin, Albert G.	OCC		
Eads, William F.	CaCC				

Rhymer, Ronald	GF	Solomon, Seymour	OCC	Weiner, Ernest M.	NYSoc
Robbins, Mrs. H. Francis	LCP	Spinelli, John A.	OCC	Wells, Joseph K.	ChCC
Rosenfeld, Hyman	ChCC	Steiner, Joseph W.	LCP	Witherow, Samuel L.	ICC
Ruggiero, Francis J.	ICC	Stevens, Harold	LCP	Wittenberg, Morton	ChCC
Salinger, Edward L.	CaCC	Sullivan, Joseph D.	CaCC	Wolfson, Milton R.	NYSoc
Samuels, Irvin H.	TUSC	Tartora, Michael J.	LCP	Women's Auxiliary of the A.P.A.	GF-CaCC
Shangold, Jules	NYSoc	Tenes, Arthur R.	ICC	Wood, Edward B.	OCC
Shor, Robert	CaCC-ICC	Thompson, Gene K.	ICC	Wunderlich, Charles H.	ChCC
Simko, Michael V.	ChCC	Toepp, Frank D.	ICC	Wunderlich, Erwin F.	GF
Snyder, Martin	CaCC	Toth, Stephen P.	ICC		
		Turchin, Charles	LCP		

The Colleges Report

The FUND has asked the colleges to submit some information on their plans and programs for future progress and development. Future issues of the *Journal* will detail additional programs.

California Podiatry College

The fund-raising program for the California Podiatry College and Hospital has nearly completed its first year and to date is an extremely successful undertaking.

The program was begun on January 1, 1960, and as of November first there has been $17,800.00 in cash raised between pledges and cash donations. In addition there are 174 pledges that average $600.00 per doctor with payments of at least $10.00 per month for each pledge. Total projected income on the basis of present pledges and cash received thus far will amount to $115,000.00 by the end of 5 years.

It is interesting to note that the percentage of podiatrists contributing to this fund locally is only slightly higher than the percentage of contributions in the Western States. This indicates that the profession at large is beginning to recognize the importance of its educational facilities.

The success of the California Podiatry Hospital as a teaching institution and as a financial venture has now enabled the Board of Trustees to lay plans for the acquisition of more property and the building of a new clinic.

The Board of Trustees of the California Podiatry College has not lost sight of the fact that the facility does not in itself teach students to be qualified podiatrists, and accordingly, our future plans include an equal division of resources toward facility and staff enlargement.

It is the present plan to develop a research institution for the advancement of basic research on the foot, in addition to expanding the present program of clinical investigation.

As to student selection—it is the avowed intention of the administration of the California Podiatry College that stress in the future be placed on quality instead of quantity, since quantity of students no longer seems to be of vital importance, as the college is now nearly up to capacity in total number of students that can be efficiently trained.

With this premise in mind, a scholarship program, under the guidance of the college's development director, John Sincock, was devised. Each year the Board of Trustees awards two tuition-paid scholarships for the full 4-year course. With the current tuition rate at $750.00 a year, the scholarships are thus worth $3,000.00 each.

These Zacharie Scholarships in Podiatry, named in honor of Dr. I. Zacharie who was appointed by President Abraham Lincoln as Chiropodist General to the United States Army, were created this year and the first two winners are currently enrolled as freshmen.

The scholarships are awarded through competitive examinations in the subjects qualifying applicants for admission. In 1961, the examinations will be held during the first week of May. Competitors need not be California residents. The examina-

tions will be held concurrently in Los Angeles and in San Francisco and possibly other locations where there is interest. Those who wish to compete should write to the college for Examination-Intent forms.

Also under the direction of Mr. Sincock, the college is becoming more closely associated with the state and local agencies to become a community institution rather than a closed podiatry workshop. Community support is desirable, but in order to be forthcoming the institution must be a community service institution as well as a podiatry education center.

The college can be said to be advancing in all facets of its activity.

List of Contributors to California Podiatry College

Allen, D.
Amberry, T.
Anderson, B.
Anderson, E.
Anderson, J.
Andrews, F.
Arenson, H.
Armstrong, R.
Aronoff, L.
Asher, N.
Atherton, A. L.
Atkinson, J., Jr.
Auerbach, N.
Avery
Ayres, R.
Bakar, L.
Balkin, S. W.
Ball, I. D.
Barbick, K.
Barton, M.
Bauer, A.
Berger, O.
Berke, I.
Bliss, R.
Block, R.
Bona, A. C.
Bowden, A.
Brantingham, C.
Brennan, R.
Brown, D.
Bruno, F.
Burkhead, H.
Burns, M.
Caggiano, C.
Caldwell, A. D.
Campbell, E.
Chan, D.
Clark, L.
Close, W.
Collins, W.
Condon, J.
Corbin, E.
Craft, D.
Craig, F. D.
Crutchfield, A.
Dacre, G.
Deffinger, T.
Delaney, E.
DeLeo, A.
Diefenbach, E.
Dodson, D.
Drew, F. F.
Dunagan, T.
Dunford, W.
DuVries, H.
Dyer, D.
Eads, W.
Eshbacher, P.
Evans, R.
Feldman, M.
Field, D.
Fields, F.
Fields, J.
Forman, L.
Foster, F.
Foster, R.
Franz, R.
Frohlich, H.
Gally, P.
Gardner, P.
Garrett, L.
Garthner, K.
Gaylord, C.
Gebhardt, J., Jr.
Gebhardt, T.
Gilbert, C.
Goldhammer, I.
Goodson, H.
Gorosh, J.
Grossman, N.
Haines, D.
Hallmeyer, M.
Hara, B.
Hardy, K. P.
Hartford, R.
Hedrick, O.
Heekin, R.
Hilbert, R.
Hilborn, E. J.
Hogan, C. A.
Howatt, J.
Hughes, R.
Hughes, T.
Hurd, J.
Hurwitz, N.
Jacoby, R.
Janson, N.
Jasperson, H.
Johns, R.
Joseph, H.
Jurman, W.
Kafka, G.
Katz, S.
Keating, J.
Keating, R.
Kelly, B.
Kligman, L.
Knott,
Larsen, L.
Lesoine, J.
Lesoine, M.
Leviant, N.
Libanoff, A.
Liss, L.
Littlejohn, W.
Locke, R.
Longin, H.
Lowe, W.
MacGregor, N.
Marshall, D.
Mason, M.
McAlpine, R.
McCauley, G.
McCord, R. E.
McNish, V.
Miles, J. C.
Mills, E.
Monaco, A.
Moody, M.
Morecraft, F.
Nelson, P.
Nichols, R.
Nott, D., Jr.
Oakley, A.
Oberlin, R.
O'Brien, T.
O'Donnell, J.
Oliver
Ormond, C.
Ozawa, R.
Pang, R.
Pepin, W. A.
Peterson, T.
Potts, G.
Pozer, W.
Prichard, R.
Pullman, M. J.
Quartararo, V.
Radforth, G.
Raphael, C., Jr.
Raphael, R.
Reynolds, W. B.
Richards, I.
Ricker, G.
Riddell, R.
Ricss, G.
Rigler, A.
Roddy, M.
Rogers, F.
Roos, A.
Root, M.
Rothman, I.
Routh, H.
Rudinger, C.
Rutherford, R.
Salinger, E. L.
Salter, L.
Sanders, J.
Schmidt, K.
Schoenfeld, J.
Self, R.
Shogren, C.
Shor, R.
Shore, G.
Shuken, J.
Siani, A. W.
Sieferman, B.
Simon, K.
Simon, M.
Sincock, J.
Smith, P.
Soward, B.
Stites, R.
Sullivan, J.
Sulzbach, J.
Swanson, V.
Swenson, R.
Taughinbaugh, C. A.
Taylor, A. R.
Tomasello, F.
Tornow, E.
Trentham, D. D.
Tripp, N.
VonDraska, D. R.
Wade, R.
Wagener, F.
Walls, A.
White, S.
Wigger, W.
Wilson, F.
Wood, R.

Chicago College of Chiropody

The Chicago College of Chiropody is in the formative stages of establishing a general hospital, new clinic, nursing home and student residence, all of which will be constructed in a square block area. With no doubt that these plans for the future will become a reality, recent developments have taken place that might make possible plans hitherto unapproached. With these possibilities, not yet concrete enough to make public, the college looks forward to major growth in the near future.

Enlarged facilities for research, which will contribute knowledge and prestige to the profession, are a major consideration in the development of the Chicago College plans. Efforts will be directed towards establishing full-time teachers and research men with budget allocations to support further and continuing education and

study by the faculty. Emphasis will be on faculty advancement in research, either individually, or conjunctively on master projects, for it is the belief of the college that the man learned enough for research, is the man qualified to teach in depth.

To date the college has received pledges of $8,580.00 and cash contributions of $5,902.00 for the Hospital Fund. To the General Fund to the School for the fiscal period 1959-1960 contributions received totaled $3,524.82.

Chicago College of Chiropody Contributions for General Fund to the School and Hospital Fund

Abdoo, S.
Alexander, D.
Allen, E. H.
Andersen, H.
Baker, L.
Balken, S. W.
Ballard, R.
Bergman, M.
Bernstein, F.
Blum, D.
Borchard, B.
Borchard, D.
Brickley, J. E.
Bromberg, M.
Bronston, G.
Brooks, C. L.
Broun, F.
Brown, A.
Buckrop, M.
Cain, J. W.
Capeling, C.
Carnow, J.
Chicago College of Chiropody Women's Guild
Cinzio, G.
Cochrane, C. R.
Cohen, A.
Cohen, G.
Cohen, H.
Collet, J.
Cope, B.
Corbett, C. W.
Cox, R. L.
Custer, G. C.
Danna, A.
De Hart, W. E.
De Hart, W. W.
De Rubeis, R.
De Zanke, C.
Diamond, L.
Dobbs, O.
Dodge, A. R.
Doller, J.
Donoho, O.
Durkin, E.
Durkin, J.
Dwyer, A.
Fauth, D.
Favenesi, E.
Flaxman, E.
Florek, M.
Fordyce, O.
Francar, H.
Frochling, W.
Frost, L.
Gardner, E. R.
Gennis, M. H.
Giannini, J.
Gibbons, S. W.
Gordon, A.
Graff, A.
Greenwald, J.
Grund, F.
Guenzler, G.
Guire, E.
Hack, M.
Hammon, J. W.
Hansen, L. H.
Hatcher, F. M.
Hayes, J.
Helbig, G.
Hiles, C.
Hines, F.
Hugar, D.
Iams, M.
Isenberg, G.
Jacobs, S. N.
Jacobson, O. A.
Johnson, C.
Johnson, M.
Kaplan, E. G.
Kalin, A.
Kaplan, L.
Kapnick, L.
Kaufman, I.
Knox, R.
Kozie, L.
La Baza, M.
Lane, M.
Larson, A. C.
Lelyveld, J.
Levin, B.
Lewis, M.
Lindsey, J. B.
Lobb, A.
Loome, T.
Lynch, E. M.
Macey, W. P.
Mattingly, E.
McLaughlin, J.
Medwid, S.
Meinecke, R.
Melcher, L.
Mertz, W. H.
Miller Shoe Co.
Moriarty, J.
Nieuwenhuis, E.
Owens, R. E.
Pace, M.
Parham, C.
Parker, R.
Parven, H.
Peterson, D. A.
Phi Alpha Pi Fraternity
Pock, L.
Poulos, P.
Raidbard, A.
Reid, M.
Rice, S. T.
Ristvey, J.
Ritz, C. F.
Rogers, F.
Rosenfeld, H.
Rosenfeld, S.
Russo, P.
Ruff, A.
St. Louis Assoc. of Chiropodists
St. Louis Chiropody Soc. Women's Guild
Saperstein Labs.
Scherer, E. E.
Scioli, E.
Scott, D.
Segal, I.
Siebert, P.
Silverman, S.
Simko, M. V.
Smith, G. J.
Smulczenski, I.
Spector, W.
Stivers, J. T.
Stivers, R. E., Lt.
Stivers, R. P.
Strauss, R.
Student Group
Sward, I.
Swigart, E.
Tau Sigma Gamma Sorority
Thome, M.
Topol, M.
Wagner, C.
Wagner, W.
Watts, C., Jr.
Weinstein, F.
Wells, J. F.
Willoughby, R.
Wilson, R.
Wittenberg, M.
Wojtak, V.
Woofter, G.
Wunderlich, C.
Zotox Pharmacal Co.

Illinois College of Chiropody and Foot Surgery

Professional preparation has been the keynote of the past year's progress and planning for the future at the Illinois College of Chiropody and Foot Surgery. In 1960 the alumni and administration took several steps forward in their cooperative program of assuring competent and adequate training of future podiatrists.

The year was marked by the establishment of two new fully equipped laboratories to round out the laboratory development program. The biochemistry and physiology laboratories were developed by Benedict J. Jaskowski, Ph.D. The two new laboratories, added to those previously equipped for histology, bacteriology, clinical and organic chemistry, provide full facilities for all laboratory courses.

In 1960 a full-time librarian was retained to handle the continually growing library. Fifty volumes of books were added through contributions by the alumni, student organizations and friends of the college.

A complete renovation of the college physical plant was initiated under the supervision of Richard Sullivan and Associates, a Chicago engineering firm. One old building was razed. Extensive remodeling and renovating, including the installation of a new automatic gas heating system of the main building, was completed.

The building remodeling, both completed and planned, conforms to the development program for the area. The

Chicago Land Clearance Commission is carrying out a community development effort for the entire neighborhood surrounding the college. A good part of the community containing 223 structures is being cleared and will be replaced by new private construction. Plans call for 1200 to 1600 modern apartments, plus related shopping facilities. Investment of private funds for new buildings will exceed 20 million dollars. When it is completed in 1962, the school will be located in one of the more attractive areas of the city.

A plan for administering scholarships, limited at the present time, has been formulated. The expanded scholarship program can be readily instituted as funds become available.

There was no turnover in faculty during the year. There was, however, an addition. Carmen J. Pintozzi, M.D., joined the instructional staff as Assistant Professor of Surgery in the fall of 1960. Dr. Pintozzi is President of the Medical Staff and Senior Staff Surgeon of Mother Cabrini Hospital. He is also on the staff of Columbus Hospital and Past Director of the Illinois Academy of General Practice.

"The Alumni Education Foundation, sponsored by the alumni, has made possible this development and increased staffing," reported Donald V. Anderson, D.S.C., Dean of the College. "With our alumni support, we are confident of continuing progress in providing the best in podiatric education at Illinois College during the years to come."

Entering the last year of a half-century of podiatric education, Illinois College has planned a number of development activities for 1961. The administrative officers are awaiting recommendations of a special committee appointed to investigate the setting up of a locomotor rehabilitation center and teaching hospital in affiliation with the college.

An existing single-story building on the school premises is to be completely remodeled to provide an additional 1500 square feet of space for instruction purposes.

In 1960, the Alumni Education Foundation passed its first milestone in aiding the educational program of Illinois College of Chiropody and Foot Surgery.

The A.E.F. completed the first phase of its nationwide fund campaign by surpassing the income goal of $25,000.00. Dr. William Scholl, founder of the college, had pledged a personal contribution of $10,000.00 when the Alumni drive attained this amount. Dr. Scholl's check was presented to the Alumni group at their luncheon held during the national meeting of the American Podiatry Association last August.

The Foundation's Board of Directors immediately turned over a check in the amount of $11,000.00 to the college, so that some of the educational improvements could be made before the start of the new term.

At the August meeting, a "Century Club" was inaugurated. The club is composed of Alumni who will pledge $100.00 per year to the foundation for every year they are active in practice. Thirteen alumni have already joined.

"Our aim is to secure 100 members in the Century Club this year," states Dr. Stewart E. Reed, president of the Alumni Education Foundation. "These funds, assuring us of $10,000.00 annually to further the educational progress of our Alma Mater, will supplement the other funds that have been pledged through A.E.F. campaigns."

A further incentive has been offered by Dr. Scholl. In a letter to Dr. Reed, he promised to contribute another $1,000.00 when 100 members have joined the Century Club.

A permanent honor roll tablet listing the members of the Alumni Education Foundation's Century Club is to be installed in the library.

It is also planned to enlist public support of the program, especially in the scholarship and institutional project areas.

Contributors to the Alumni Education Foundation of the Illinois College of Chiropody and Foot Surgery as of Nov. 25, 1960.

Abernethy, C. G.
Abernethy, J. Lloyd
Abernethy, Lee D., Jr.
Adams, Joy E.
Bachelor, Frank, Jr.
Barnes, John H.
Barrock, A. Edward
Beach, C.
Beach, N.
Behrends, Robert L.
Bergen, Sydney
Brabender, Wm. M., Jr.
Brachman, P. R.
Brooks, Charles B.
Burleson, Thomas E.
Burnett, Agnes
Butler, B. A.
Caneva, Reno
Cardy, Donald K.
Carnes, Robert R.
Conrad, Charles F.
Corbertt, C.
Curran, Eugene F.
Cutrell, C. G.
Dahl, G. Conrad
D'Alemberte, C.
Davis, J.
Dennison, Donald W.
Devorsak, E.
Donohue, E. F.
Dryfuse, R.
DuCote, A. Avit
Dye, Ralph W.
Ellison, W. E.
Erdmann, Gilbert E
Falknor, Gordon
Feinberg, Herbert
Franson, Wilbur
Friedl, A. W.
Friedl, C. M.
Friedman, Joe
Frisch, Wm. J.
Garcia, D. James
Gartner, Leo G.
Genesco, Shoe Company*
Giese, Edward L.
Gillham, Lloyd A.
Graham, John R.
Green, S. M.
Guthmann, H. C.
Haas, Morris
Hackel, Carl
Hadden, H. E.
Hansen, A. G.
Harler, A. J.
Harvey, Marshall
Hecht, H.
Heidenreich, Irvin A.
Hill, Walter H.
Hoag, Gerald
Hochman, Edward L.
Hogan, G. D.
Holton, Mildred
Howard, C. T.
Howie, George*
Husted, C.
Inbody, H.
Jackson, Wm.
Jacobson, Bernard H.
Kirkwood, Ralph C.
Kohl, Jack M.
Korn, John C.
Kozie, L. J.
Kramer, Martin*
(Martin Kramer Shoe Co.)
Krause, L. E.
Krausz, Chas. E.
Krayer, John D.
Kruger, Howard W.
Larson, Thomas J.
Lefler, L. G.
Lerner, Leonard H.
London, Eugene
Lootens, Richard H.
McAvoy, G. L.
McCay, Thomas F.
Marr, M. D.
Martin, W. G.
Mattison, John L.
Meyer, Curry L.
Michael, Budd H.
Miller, Don M.
Misuraca, Charles A
Morris, Robert R.
Mosena, C. J.
Nielsen, Kenneth C.
Nott, Don, Jr.
Oppenheimer, Leo D., Jr.
Ornstein, Seymour
Pellegrini, Edward E.
Pickett, Ned J.
Pomerantz, Max M.
Radden, Walter
Reinheimer, Claude
Reinking, Arrel C.
Reizner, Harry C.
Richert, Arthur
Riesgraf, Lola T.
Riley, John H.
Robin, Gerald M.
Roggenkamp, O. E.
Rosen, L. N.
Ross, Jack N.
Rubin, A.
Rubin, M.
Saff, H. J.
Sansone, Ralph Ed.
Sartor, Alice J.
Sauder, Harold J.
Schroedel, Esther
Seiler, Joseph E.
Shaffer, J. C.
Shanley, John D.
Sharp, Bernard
Sheff, Earl
Simon, Abram
Stein, Benjamin C.
Stucky, L. R.
Suppan, Raymond J.
Svoboda, N. F.
Sylvester, W. W.
Tack, Henry C.
Tanner, R. E.
Thomson, Raymond
Trowitch, Robert G.
Triplett, Robert
Tucker, Basil M.
Turchin, J. M.
Turner, Nicholas R.
Uchimura, Masa
Udell, Maurice
Varzos, Peter N.
Vieg, Roy M.
Weiseman, Harold G.
Wheeler, Harold E.
Whitten, L. Wayne
Wicks, Vaughn Edward
Wright, Robert L.
Yale, Irving
Zichichi, Nicholas
Zotox Pharmacal Co., Inc.*

M. J. Lewi College of Podiatry

The facilities of the M. J. Lewi College of Podiatry have always surpassed the minimal requirements of both the Council on Education of the A.P.A. and the University of the State of New York. The most recent additions to the college teaching facilities are:

1. A closed circuit television set-up composed of a portable camera with a receiver in each of three classrooms and an intercommunication system which is in use for teaching and demonstration purposes. This permits close-up unobstructed viewing by over 150 students or practitioners of the delicate, oft-hidden intricacies of surgical operations and various mechanical procedures. The circuit has been used for classroom demonstrations, convention programming and scientific seminars.

2. A second operating room has been added to the facilities of the Department of Podiatric Surgery. Both rooms may be used simultaneously for operations and/or redressings; a glass enclosure permits complete visibility of the newer operating room with no disturbance to or interference with operative procedures.

3. A complete clinical laboratory provides for all necessary laboratory tests and examinations; macroscopic, microscopic and chemical. All these tests, urinalyses, complete blood workups for preoperative cases, bacterial cultures, sensitivity tests, mycologic studies, erythrocyte sedimentation rate, N.P.N., etc., are actually performed by students assigned to the laboratory on a rotating basis, thus providing each and all of them with practical training and experience in this important adjunct to professional practice.

4. Ultrasonic and Diapulse Therapy equipment is available for use in connection with the treatment of patients.

5. Research projects are almost constantly in progress at the college. Students are required to do original research. In fact, it is mandatory that each senior submit a thesis in partial fulfillment of the requirements for a Doctorate. Such thesis must be original research work of a clinical or laboratory nature. With grants provided by various reputable pharmaceutical organizations, clinical research based on scientific principles is being done.

6. The physical facilities of the Children's Clinic are shortly to be augmented by means of a recent grant given to the college for this purpose. The physical space of the clinic is to be enlarged and new diagnostic and therapeutic equipment is to be provided which will significantly broaden the ability to care for children's feet.

New York Podiatry Center

The authorities of the college, certain that a permanent charter will be granted, have formulated plans for a "Podiatry Center" in New York City, comprised of: the M. J. Lewi College of Podiatry, a hospital designed for the care of the foot and a research center for the scientific evaluation of foot problems.

The M. J. Lewi College of Podiatry

It is envisioned that the college will have the finest facilities available for the training of the foot specialist, with room for necessary expansion as more facilities inevitably become required. The building will be devoted exclusively to didactic instruction and will include classrooms, library, laboratories, auditorium, lounges, locker rooms, dining room facilities, administrative offices and a solarium.

The Hospital

Plans for a hospital are based on the needs of the teaching institution and the profession as a whole. A 50- to 100-bed institution with in-patient and out-patient departments is contemplated. The out-patient department will provide the required clinical internship training; the in-patient department will provide internship training and residencies in the various specialized areas. Contemplated also are podiatric surgical and podiatric orthopedic residencies. All the clinical aspects of podiatric training would be housed under one roof, including a mortuary with dissection facilities. For all practical purposes, the hospital would be best situated adjacent to the college or in the immediate vicinity.

The Research Center

Organized, scientific exploration of the problems peculiar to the foot is a prime necessity if podiatry is to maintain and augment its place in the professional world. Such a center, properly staffed, scientifically and adequately equipped, and able to draw upon the college and the hospital for experimental material, would insure the maintenance of podiatry's growth as a specialty.

The manifold advantages of the existing location of the college make it advisable that the present locus be retained and the Podiatry Center built around it. The cost of redesigning the present edifice as planned has been estimated at $100,000. Land adjacent to the college can be purchased for the construction of the Hospital and Research Center. Estimated cost of such purchases, razing of existing structures and erection of a 50-bed hospital and a research center completely furnished, is $1,100,000. Thus the total cost for the establishment of a Podiatry Center as outlined is estimated to be $1,200,000.

To date, contributions for the Charter Fund for the college include those given by Eric St. John, Peter Mogull, Mario Miletti, Milton Henenfeld and Milton Walkes. The bank account escrow for the Charter Fund now contains $10,910.00.

Ohio College of Chiropody

Long range plans of the Ohio College of Chiropody include the addition of a physiology laboratory, research facilities, additional classrooms and offices. It is estimated that about $140,000 would make these changes possible and also bring the existing physical facilities up to date.

In addition to these plans, the creation of a Locomotion Rehabilitation Center in conjunction with the Cleveland Foot Clinics of the Ohio College of Chiropody is being considered. Estimates for the cost of this center vary from $350,000 to $600,000.

At present there are two scholarships available at the Ohio College, and a third one is in the process of being established. The Ohio Chiropodists Association offers a scholarship for an Ohio resident. Wynlit Pharmaceuticals, Inc., offers the Dr. William B. Ignatoff Memorial Scholarship, which is granted annually to two students, one Junior and one Senior. The Western Pennsylvania Chiropody Association is setting up a scholarship fund for use at Ohio College. This scholarship will probably be restricted to a resident of Pennsylvania.

In all, a total of $3,596.00 has been contributed to the Development Fund of the Ohio College of Chiropody during the 1960 calendar year. The amount pledged and the amount received were identical, $2,178.00.

Ohio College of Chiropody
Development Fund Contributors

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The Association for the Philadelphia College of Chiropody

A little over a year ago, the idea to establish a new college in our area was placed before Dr. James C. Giuffré, Medical Director of St. Luke's and Children's Medical Center. It was Dr. Giuffré who not only agreed with the idea, but pointed out to the profession the need for the school, not only for the training of chiropodists, but to maintain an avenue for research and postgraduate training. From that time on, many men worked to bring this dream to its culmination. Dr. Giuffré accepted the post of Dean.

After many meetings and long hours of work, the dream began to unfold. Articles of Incorporation were drawn and a petition for a Charter to grant degrees was submitted to the Pennsylvania Department of Education. In October of 1960, formal approval for the formation of the Philadelphia College of Chiropody, Affiliate, St. Luke's and Children's Medical Center, was received.

Following formal notification of the Charter for the formation of the Philadel-

phia College of Chiropody and the granting of the degree, D.S.C., members of the Board of Trustees of the College and the group working with the Board felt a need for a group to foster the project.

As there are no Alumni of the College per se, a plan was formulated to form an Association for the College, to act as an Alumni Association would, in any building or expansion program.

The major purpose of the Association would be to act as the "right arm" for the college. It would promote the field of chiropody-podiatry and act as the public relations, fund-raising, and coordinating group for the formation of the college.

A general meeting of all chiropodists-podiatrists in the area took place Sunday, December 18, 1960, at the Sheraton Hotel in Philadelphia. The purpose of the meeting was to form the Association for the Philadelphia College of Chiropody.

At that meeting, officers were elected: President, Dr. Albert Kilberg of Camden, N. J.; Vice President, Dr. Irving Engel of Philadelphia, Pa.; Recording Secretary, Dr. Arthur E. Helfand of Philadelphia, Pa.; Corresponding Secretary, Dr. Matthew T. Lettieri of Upper Darby, Pa.; and Treasurer, Dr. Angelo S. Monaco of Havertown, Pa.

Three men were also appointed by Dr. Kilberg to serve as a Council to complete the Executive Board of the Association. Named were: Drs. Lee Lindenberg, Leon L. Brandolph, and Sidney Wolff.

The Board of Trustees of the College is Drs. Rubin, Zislin, Harford, Ziegler, Jr., Forman, Giuffré and Mr. Saul and Mr. Ginsburg. They (the Trustees) will serve with the Executive Board as an Executive Committee for the college.

At the meeting rules and resolutions were adopted and committees appointed to examine all aspects for the formation of the college.

Those present at the meeting became Charter Members of the Association and all those in the profession interested in seeing a new institution of learning for the profession, were and are urged to join the Association and help promote the formation of the college.

Francis A. Kalbacher Joins Association's Staff

In January, Mr. Francis A. Kalbacher accepted the position of Assistant Director in the Association's headquarters office. His primary responsibilities will be in Public Education and Information. Because of his past experiences, he will serve as secretary of the Special Commission on the Status of Podiatry (Chiropody) Education (See page 129).

Mr. Kalbacher comes to us from the World Health Organization where he was Chief, Office of Reports. He was responsible for the administrative, editorial and public relations functions. He conducted extensive speechmaking before public health organizations, university groups and others. From 1946-56 (except for Korean War service) he was with the United Nations as statistician and administrator.

He received his B.S. degree from Fordham University and his M.A. from Columbia University, where he also did work towards his doctorate. Mr. Kalbacher served with the United States Marine Corps in World War II and the Korean War. He presently holds the rank of Lieutenant Colonel in the Marine Reserve, having originally enlisted as a private. He is married, 40 years of age and the proud father of one daughter and five sons.

The addition of Mr. Kalbacher to the headquarters staff is part of the staff expansion that the 1960 House of Delegates directed the Secretary and Editor to institute. (See Resolution No. 67, Vol. 50, No. 12, Journal of A.P.A., December 1960, page 992). The past few months have brought three other new faces to headquarters, only one of which is a replacement. On page 84 of this issue will be found the present complement of your headquarters staff.

(Ashur—continued from page 108)

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Organization News

Secretaries of local, state, regional, affiliated, subsidiary and other related organizations are invited to submit copy for these columns.

Arizona

The annual meeting of the Arizona Podiatry Association was held January 7-8, 1961, at the Hotel Valley Ho, Scottsdale, Arizona. Two new members, Dr. Paul Fabricant of Phoenix and Dr. Eugene Strong of Mesa, were welcomed by the association. Dr. Merton Root of San Jose, California, guest speaker, sponsored by the California College of Podiatry, spoke on the classification of foot types, casting technique and the use of plastic for foot balancing.

The following officers were elected: President, Daniel Nenad of Phoenix; Vice President, Eugene Shank of Tucson and Secretary-Treasurer, Irwin Shapiro of Phoenix.

Minnesota

At the December quarterly meeting held in Minneapolis, attending members participated in the Kuder D Test (a personal interest test used to develop a guide for vocational counseling). The scientific program was a multi-panel presentation on peripheral vascular lesions, pathomechanical roentgenology, injection therapy and institutional care of the aged, under the chairmanship of Dr. Sabann.

The Women's Auxiliary put on their annual Christmas party, organized by Mrs. Jean Olson and Mrs. Dorothy Ueland.

The Minnesota Academy of Foot Surgeons

A study group of Minnesota members held a 3-day surgical seminar in Austin, Minnesota, at which Dr. Amberry of Long Beach, California, was the principal speaker. The banquet featured addresses by two members from the Minnesota State Medical Association, who spoke on "Interprofessional Relations."

"LIFE'S FOUNDATION — YOUR BABY'S FEET" is an outstanding and comprehensive booklet on the growth and care of children's feet. Written for the layman, it is concise, cleverly illustrated and will prove valuable especially to the parents of young children. Many Podiatrists-Chiropodists have received a copy of this booklet and have ordered them in quantity. For those of you who have not ordered and for those who wish to reorder, please clip the order blank below and mail with your check for your supply.

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Ohio

The Ohio Chiropodists' Association announces its second postgraduate course at the Ohio State University Medical Center: "Postgraduate Course in Industrial Medicine for Chiropodists," March 17, 18, 19, 1961, at the University Hospital, Columbus, Ohio. Some of the subjects are: "What Management Expects of the Medical Department," "The Role of the Medical Department in Industry," "The Organization of the Medical Department," "Physical Layout for the Medical Department," "The Industrial Nurse," "The Safety Engineer," "The Industrial Hygiene Engineer – His Duties & Responsibilities," "Medical Records in Industry," "The Preplacement Physical Examination," "Periodic Health Appraisals," "Treatment of Occupational and Non-occupational Illness in Industry," "Economic Aspects of the Medical Department of the City of Columbus," "The Medical Division of the Ohio Industrial Commission," "Medical and Legal Aspects of Industrial Medicine," "A Study of Industrial Medical Directors' Attitudes Toward the Use of Chiropodists in Industry," "Why I Want Chiropodists in Industry," "Responsibilities of Chiropodists in Industry," "Developing a Program of Industrial Foot Health" and "Total Attitude of Chiropodists to Industry–New Ideas Relative to Industrial Affiliation."

The faculty is headed by William F. Ashe, M.D., Professor and Chairman, Department of Preventive Medicine, Ohio State University Medical Center. Faculty includes other representatives from the university, medical directors and other personnel from industry, and chiropodists with industrial experience.

The following are faculty members: Mr. Dean Phillips; B. D. Dinman, M.D., D.Sc.; W. W. Davis, M.D.; Mrs. Helen Eckley, R.N.; Mr. John Paynard; Mr. L. B. Roberts; Ben Kaplan, M.D.; A. L. Kefauver, M.D.; Mr. Paul Selby, Jr.; Edward Buyniski, M.D.; James Conforti, D.S.C.; and Pat Holt, D.S.C.

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Pennsylvania

Northwestern Division

A regular meeting of the Northwestern Division of the Chiropody Society of Pennsylvania was held January 8, 1961, in the Exchange Hotel in Franklin. Dr. Quinton Crawford presided. Dr. Chester Rossi, Public Relations Chairman, announced that chiropodists will be paid by Blue Cross for treatment of federal employees. Dr. T. P. Huels informed the members of the coming Region 3 Convention to be held in Atlantic City, urging them to plan now to attend.

Following the business meeting, Dr. B. C. Egerter presented a lecture and demonstration on Professional Practice Management. The wives were entertained in the home of Dr. and Mrs. Hamilton, where they were joined by the members after the meeting.

The next meeting will be held in Franklin on February 19, 1961.

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Fort Devens Civilian Podiatrist Honored

Dr. Arthur Roberge, civilian podiatrist at Fort Devens, Mass., was honored for outstanding performance rating by Major General William J. Verbeck, Commanding General. An award of $150.00 was presented to Dr. Roberge at the army hospital by Colonel Herbert D. Edger, Commander.

Zaccharian Research Society

The Society sponsors a lecture by outstanding men in the various medical fields annually in memory of Dr. Carrol M. Verovitz, who was Professor of Circulatory Diseases at the Ohio College of Chiropody for 25 years. This year, Dr. George S. Phalen, a member of the staff at Cleveland Clinic Hospital, Department of Orthopedic Surgery, will lecture on "Pediatrics for the Chiropodist." The lecture will be held at the Ohio College of Chiropody auditorium on Friday, March 10, 1961, 8:30 P.M.

American Shoe Fitting Institute, Inc.

A non-profit educational subsidiary has been announced by Mr. Sam Smith, President of Yankee Shoemakers, Inc., to be known as the American Shoe Fitting Institute, Inc. The Institute has been organized to train retail store personnel in the proper techniques of fitting shoes. A correspondence course will be offered to all who meet entrance requirements.

Ross Tennant, D.S.C., Director of Research for Yankee Shoemakers, has been named President of the American Shoe Fitting Institute. Dr. Tennant will be remembered as having been a member of the faculty of both the Illinois and Chicago Colleges of Chiropody.

The course offered by the Institute is intended to assist the shoe fitter to improve his qualifications to fit footwear and to fill orthopedic shoe prescriptions, subject to the approval of the practitioners who issue the prescriptions.

The American Shoe Fitting Institute advises, "It is in no way intended to qualify

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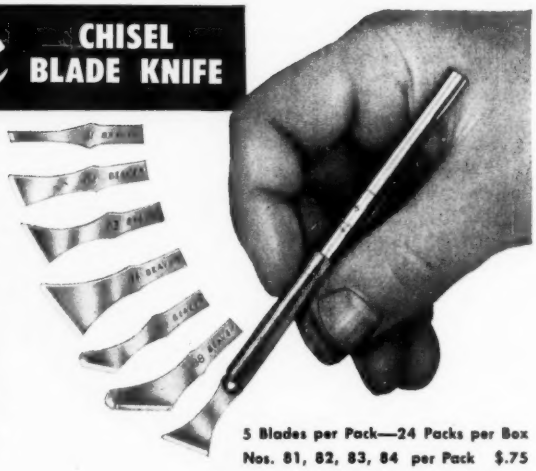

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or encourage the shoe fitter himself to diagnose foot conditions or to prescribe corrective or preventive measures for defects of weight placement, gait or posture or corrective or preventive measures for defects, deformities or abnormalities of the feet."

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Chicago, Ill.

Oscar Z. Blomquist
Watertown, Mass.

Glen Mack Fishburn
Ogden, Utah

S. K. Richardson
Detroit, Mich.

Frank A. Silver
Boulder, Colo.

Dr. Silver passed away December 21st in Boulder, Colorado, after a long illness. He graduated in 1919 from the Colorado College of Chiropody and retired from practice in March 1960.

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Remember this: If each member was responsible for recruiting just one new student every 15 years, our freshman classes in all of the podiatry colleges would triple in size!

LET EACH ONE OF US DO OUR PART!

Mrs. Cleotha Parham, President

Silvers *(Continued from page 127)*

Of practical importance is the recognition of the condition which has been mistaken for ringworm, erythema multiforme, cancer of the skin, tuberculosis of the skin, friction dermatitis, insect bites, drug eruption, psoriasis, sarcoid and annular lichen planus.

Summary

A case of granuloma annulare involving the foot has been reported. The condition has been discussed, and the importance of its recognition has been stressed.

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Foot Health Week

May 14-20, 1961. Sponsored by American Foot Health Foundation.

Youth Foot Care Week

Oct. 15-21, 1961. Sponsored by American Foot Health Foundation.

MEETINGS

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Region Three

(Del., Md., N. J., Pa.)
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(Ohio)
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Region Five

(Ill., Ind., Mich., Wis.)
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Region Six

(Colo., Iowa, Kan., Minn., Mo., Nebr., N. Dak., S. Dak.)
Des Moines, Iowa, Apr. 7-9, 1961.
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425 Kresge Bldg., Des Moines, Iowa

Region Seven

(Idaho, Mont., Ore., Wash., Wyo.)
Portland, Ore., May 5-7, 1961.
Sheraton Hotel
Vance A. McNish, Convention Chairman
1218 Selling Bldg., Portland 5, Ore.

Region Eight

(D. C., N. C., S. C., Va., W. Va.)
Charles Turchin, Chairman
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Region Ten

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Dr. Paul Lefkoff, Secretary
202 Burdine Bldg., 849 Peachtree St., N.E.,
Atlanta, Ga.

Region Eleven

(Ark., La., N. Mex., Okla., Texas)
Fort Worth, Texas, June 14-17, 1961
Hotel Texas
16th Southwestern Chiropody Congress
44th Annual Convention of Texas Society
Dr. Joseph R. Ordile, 111 Professional Bldg.,
Ft. Worth 4, Tex.

Region Twelve

(Ariz., Cal., Nev., Utah)
San Francisco, Calif., May 24-28, 1961.
Jack Tar Hotel
David Y. Chan
2107 Van Ness Ave., San Francisco, Calif.

International Union of Podology

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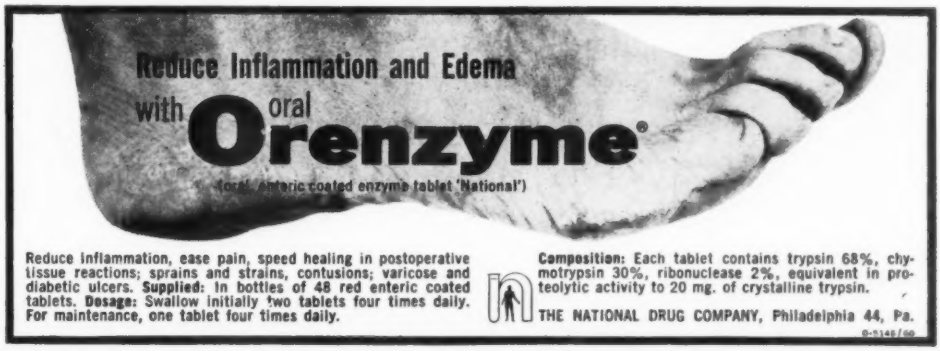
Belgium, France, W. Germany, Holland, Spain, Switzerland, Argentina, Sept. 8-12, 1961.



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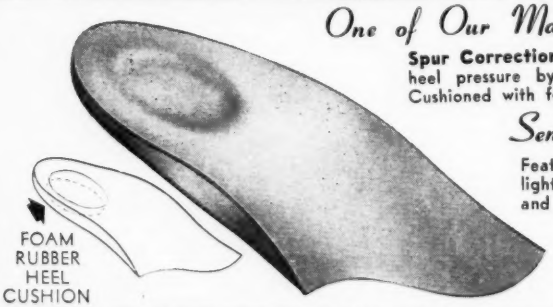

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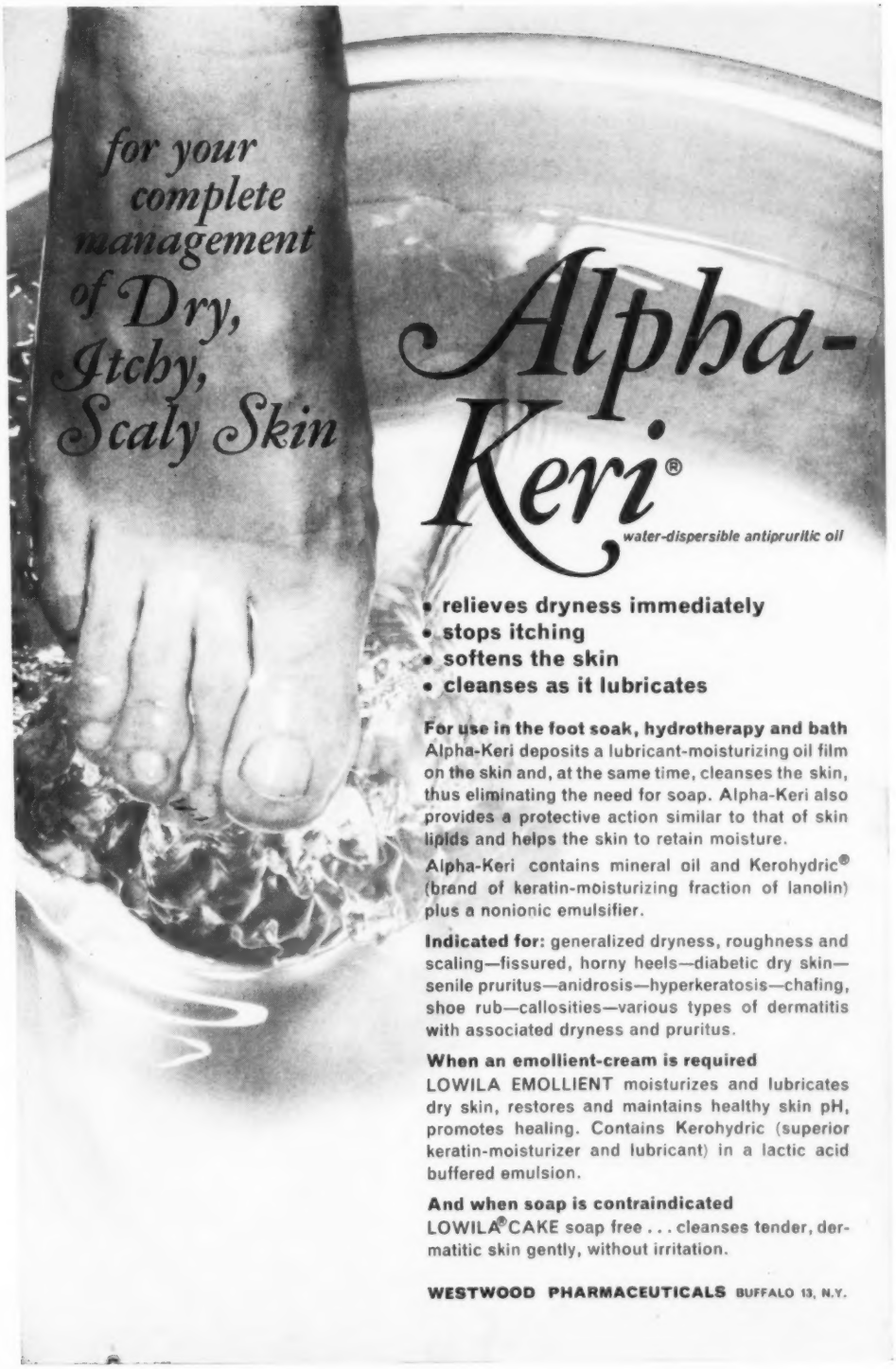
Featuring a new complete line of featherlight flexible supports for high fashion shoes and for even the most extreme styles.

a.f. Trevino co.

CREATORS AND MANUFACTURERS OF FOOT COMFORT PRODUCTS **506 E. Yandell Dr. El Paso, Texas**


for your complete management of Dry, Itchy, Scaly Skin
Alpha-Keri®
water-dispersible antipruritic oil
• relieves dryness immediately
• stops itching
• softens the skin
• cleanses as it lubricates
For use in the foot soak, hydrotherapy and bath
Alpha-Keri deposits a lubricant-moisturizing oil film on the skin and, at the same time, cleanses the skin, thus eliminating the need for soap. Alpha-Keri also provides a protective action similar to that of skin lipids and helps the skin to retain moisture.
Alpha-Keri contains mineral oil and Kerohydric® (brand of keratin-moisturizing fraction of lanolin) plus a nonionic emulsifier.
Indicated for: generalized dryness, roughness and scaling—fissured, horny heels—diabetic dry skin—senile pruritus—anidrosis—hyperkeratosis—chafing, shoe rub—callosities—various types of dermatitis with associated dryness and pruritus.
When an emollient-cream is required
LOWILA EMOLLIENT moisturizes and lubricates dry skin, restores and maintains healthy skin pH, promotes healing. Contains Kerohydric (superior keratin-moisturizer and lubricant) in a lactic acid buffered emulsion.
And when soap is contraindicated
LOWILA® CAKE soap free . . . cleanses tender, dermatitic skin gently, without irritation.
WESTWOOD PHARMACEUTICALS BUFFALO 13, N.Y.

Athlete's foot is caused by fungi invading the horny, keratinized layers of the skin not reached by the normal blood supply. Topical application of DESENEX, a combination of zinc undecylenate and undecylenic acid, brings these powerful antifungal agents into direct contact with troublesome fungi and quickly relieves—**and arrests**—the annoying condition.

Hundreds of thousands of athlete's foot infections have been arrested by topical treatment with DESENEX, among the best tolerated of all potent fungicidal agents.

And DESENEX is inexpensive—only pennies per treatment: DESENEX Ointment can be applied liberally to both feet every night for a week and a half from only a single tube. Itching and discomfort are stopped almost immediately. DESENEX is also recommended for treatment of other susceptible fungus infections of the skin and nails.

Dosage: At night, supply Ointment liberally to infected and surrounding areas. In the morning, rub or shake powder into the shoes and feet.

Supplied: Ointment—1 oz. tubes and 1 lb. jars. Powder—1½ oz. and 1 lb. containers. Solution (Undecylenic acid)—2 fl. oz. and 1 qt. bottles. Aerosol Spray—6 oz. cans.

Maltbie Laboratories Division,
Wallace & Tiernan Inc., Belleville 9, N. J.

Available in Canada through Elliott-Marion Company, Ltd., Montreal. PD-11